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THE SURGERY OF THE BRACHIAL PLEXUS.

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A detailed account of the surgical anatomy and morbid physiology of the brachial plexus is not included in the majority of the current manuals of surgery. Consequently, the accurate diagnosis of its surgical affections may be arrived at late, and the prospect of a cure greatly diminished. Deformities are often allowed to occur, for example, atrophy and overstretching of the paralysed muscles and contraction of the opposing muscles and complete recovery of function may be impossible, even though the muscles may regain the power of voluntary movement. Furthermore, plexus injuries are by no means rare, and yet there is no generally recognized system of management.

A.—Anatomy.

(1) *General.*

If we examine a dissection of the neck, we find a vertical intermuscular cleft, bounded anteriorly by the *rectus capitis anticus major* and *scalenus anticus*, and posteriorly by the *rectus capitis lateralis* and the *scalenus medius*, from which nerves emerge to form plexuses. The nerves in the upper part of the cleft form the cervical plexus and those in the lower part the brachial plexus. It is well known that the brachial plexus is subject to many variations. A typical brachial plexus is formed by the anterior primary divisions of the four lower cervical nerves, and the greater part of the anterior primary division of the first dorsal nerve, and may be reinforced by the fourth cervical and second dorsal nerves; the plexus includes the trunks and cords formed by the junction of these nerves and their decussations, but not the individual named nerves arising from these.

(2) *Nerves.*

The anterior primary divisions of the lower cervical nerves lie internal to the outer border of *scalenus anticus*. The trunks and cords forming the brachial plexus proper lie external to this muscle. In the intervertebral part of their course the nerve roots are enclosed in a separate sheath of *dura mater*, and the spinal ganglia are found lying in the intervertebral foramen.

After leaving the intervertebral foramen, the fifth, sixth and seventh nerves lie in the concave gutter formed by the transverse processes. The eighth cervical nerve crosses the anterior surface of the seventh transverse process, and the first dorsal nerve crosses upwards, in front of the neck of the first rib. It is important to note that the uttermost white ramus of the sympathetic system is given off by the first dorsal nerve immediately it escapes from the intervertebral foramen.

The fifth cervical nerve is composed of bundles loosely bound together to form the anterior primary division. Low and Harris have demonstrated that the bundles carrying the fibres for the circumflex and musculo-cutaneous nerves can be easily separated from each other, and that each bundle can be stimulated independently by electrical currents. These observers found that the fibres supplying the deltoid run on the outer and upper side of the nerve, and those for the supply of the biceps and other muscles on the lower and inner side.

(3) *Trunks.*

These nerves unite to form three trunks in that part of their course, which lies external to the outer border of *scalenus anticus*:—

(*a*) The fifth and sixth cervical anterior primary divisions unite just after emerging from under cover of the *scalenus anticus* to form the upper trunk.

(*b*) The eighth cervical and first dorsal anterior primary divisions unite behind *scalenus anticus* to form the lower trunk.

(*c*) The seventh cervical anterior primary division goes to form the middle trunk.

(4) *Divisions.*

A redistribution of the fibres in these trunks takes place by the division of the trunks into anterior and posterior divisions, which again unite to form three nerve cords, and these ultimately break up into the individual nerves supplying the various parts of the upper limb. The plexus may contain an increased number of fibres from the fourth cervical or from the second dorsal nerves. This shifting cephalwise or caudalwise is not necessarily produced by the absorption of nerves which are normal constituents of the plexus. Under ordinary conditions, the inclusion of additional cervical nerve fibres is associated with a reduction in the number of dorsal fibres, and *vice versa*.

(5) *Branches.*

Early in its course the fifth cervical nerve gives off the dorsal scapular nerve (*A*) to the rhomboids. This nerve usually arises in common with the upper root of the posterior thoracic nerve to the *serratus magnus* and, piercing the *scalenus medius*, proceeds downward under cover of the *levator anguli scapulae*.

The suprascapular nerve (*B*) is also derived from the fifth cervical, and its point of origin is immediately before or just after this nerve unites with the sixth cervical. The *serratus magnus* is supplied by the posterior thoracic nerve (*C*), which is composed of a large twig from the sixth cervical nerve and smaller branches from the fifth and seventh cervical nerves, the former taking origin in common with the dorsal scapular nerve. These anatomical facts act as clinical guides to the seat of pathological lesions. But while we may conclude that, because of the paralysis of certain muscles, the lesion is above the point of origin of their nerves, the reverse is not necessarily true. The lesion may be above the level of the point of origin of a nerve supplying a functionating muscle. The damage caused by an accident or disease is not comparable to an experimental section of a nerve.

The amount of contribution of the first dorsal nerve varies greatly. It may furnish a slender twig, a large cord, or practically the whole of its bulk to the plexus, under conditions spoken of as normal; but with a large contribution from the first dorsal nerve the tension between the lowest cord and the first rib increases, as is evidenced by the increasing depth of the *sulcus subclaviae* and even a bending downwards of the first rib. The brachial plexus receives a communication from the second dorsal nerve in 70% of cases (Cunningham), and when this contribution is large, it may lead to a curtailment of the first rib, which then presents characters like those of a cervical rib. In many cases this communication is merely an outlying part of the sympathetic; on section it is found to be composed to a large extent of non-medullated and small medullated fibres. These fibres form part of the visceral supply of the upper limb, and, in consequence of their position in the plexus, they, as well as the other fibres passing direct from the spinal cord into the dorsal nerve, are liable to the mechanical pressure of a cervical rib.

The anatomical classification of the branches of the brachial plexus is of doubtful clinical value.

A. Supraclavicular Branches.

(*a*) Anterior.
- (*i.*) Nerve to the scalenus anticus and longus colli (C. V., VI., VII., VIII.).
- (*ii.*) Nerve communicating with the phrenic nerve (from C. V.).
- (*iii.*) Nerve to the subclavius (C. V., VI.).

(*b*) Posterior.
- (*i.*) Nerve to the scalenus medius and posticus (C. V., VI., VII., VIII.).
- (*ii.*) Nerve to the rhomboids (dorsal scapular) (C. V.).
- (*iii.*) Long thoracic nerve (Bell), (C. V., VI., VII.).
- (*iv.*) Suprascapular nerve (C. V.).

B. Infraclavicular Branches.

(*a*) Axillary.
- (*i.*) Outer cord, external anterior thoracic (C. V., VI.).
- (*ii.*) Inner cord, internal anterior thoracic (C. VIII., D. I.).
- (*iii.*) Posterior cord—
  - (*a*) Upper subscapular nerve, to subscapularis (C. V., VI.).
  - (*b*) Middle subscapular nerve, to latissimus dorsi (C. VII., VIII.).
  - (*c*) Lower subscapular nerve, to subscapularis and teres major (C. V., VI.).

C. Brachial Branches.

(*a*) Outer cord.
- (*i.*) Musculo-cutaneous—
  - (*a*) Muscular branches to—
    - Biceps (C. V., VI.).
    - Coraco-brachialis (C. VII.).
    - Brachialis anticus (C. V., VI.).
  - (*b*) Cutaneous—
    - Anterior branch.
    - Posterior branch.
- (*ii.*) Median nerve (from outer and inner cords).
  - (*a*) Forearm branches—
    - (*i.*) Articular branch to elbow.
    - (*ii.*) Cutaneous branch to palm.
    - (*iii.*) Muscular branches to—
      - Flexor sublimis (C. VII., VIII., D. I.).
      - Palmaris longus (C. VIII.).
      - Flexor carpi radialis (C. VI.).
      - Pronator radii teres (C. VI.).
  - (*b*) Anterior interosseous branches—
    - Flexor longus pollicis (C. VIII., D. I.).

Pronator quadratus (C. VIII., D. I.).
Flexor profundus digitorum, half (C. VIII., D. I.).
(*c*) Cutaneous branches to hand; 3½ fingers in front.
(*d*) Muscular branches to hand—
Opponens and abductor pollicis (C. VI.).
Lumbricals (first two, C. VI.).
Flexor brevis pollicis (outer head, C. VI.).

(*b*) Inner cord.
(*i.*) Ulnar nerve.
(*a*) Branches to forearm—
(*i.*) Articular to elbow.
(*ii.*) Cutaneous—
Palmar.
Dorsal.
(*iii.*) Muscular—
Flexor carpi ulnaris (C. VIII., D. I.).
Flexor profundis digitorum, half (C. VIII., D. I.).
(*b*) Branches to hand.
(*i.*) Superficial palmar.
Cutaneous (1½ fingers in front).
Muscular—
Palmaris brevis.
(*ii.*) Deep palmar—
Articular to wrist joint.
Muscular—
Short muscles of little finger (D. I.).
Interossei (C. VIII., D. I.).
Adductor transversus pollicis (C. VIII.).
Adductor obliquus pollicis (C. VIII.).
Flexor brevis pollicis, half (C. VIII.).
Lumbricals, inner two (C. VIII., D. I.).
(*ii.*) Internal cutaneous nerve.
(*iii.*) Lesser internal cutaneous nerve.

(*c*) Posterior cord.
(*i.*) Musculo-spiral nerve.
(*a*) Branches to the upper arm—
(*i.*) Inner branches—
Muscular—
Triceps (outer and long head, C. VII., VIII.).
Internal cutaneous.
(*ii.*) Posterior branches—
Muscular—
Triceps, inner head (ulnar collateral) (C. VII., VIII.).
Anconeus (C. VII., VIII.).
(*iii.*) Outer branches—
Cutaneous—
Superior.
Inferior.
(*iv.*) Anterior branches—
Muscular—
Supinator longus (C. VI.).
Extensor carpi radialis longior (C. VI., VII.).
Brachialis anticus (C. V., VI.).
(*b*) Radial nerve.
(*c*) Posterior interosseous nerve—
(*i.*) Anterior—
Supinator brevis (C. VI.).
Extensor carpi radialis brevior (C. VI.).
(*ii.*) Posterior—
Extensor communis digitorum (C. VII.).
Extensor minimi digiti (C. VII.).
Extensor carpi ulnaris (C. VII.).
Extensors of the thumb, three (C. VII.).
Extensor indicis (C. VII.).

(*ii.*) Circumflex nerve.
(*a*) Anterior division—
Muscular to anterior and middle portion of the deltoid.
Cutaneous.
(*b*) Posterior division—
Muscular to posterior portion of deltoid and teres minor (C. V., VI.).
Cutaneous.
(*c*) Trunk—
Articular branch to shoulder joint.

B.—**Physiology.**

This scheme follows the account given in the standard text-books of anatomy, but, usually, no reference is made to the composition and distribution of the anterior primary divisions of the several nerves which are the common sites of surgical lesions. The supply of the various muscles is frequently indicated in accordance with the results of section of the nerves and of splitting them into their component elements.

It has been found from clinical experience that the greater part of the motor supply depends upon one root only, although fibres from more than one root can be traced to the individual muscles of the upper limb.

Stimulation during the course of operations and the results of a study of the morbid physiology reveal that this distribution of the anterior primary divisions obtains in the majority of cases.

The root distribution is arranged as follows:—

(*a*) The motor supply from the fifth cervical root goes to the scapulo-humeral and supinator muscles, to the deltoids, the biceps, brachialis anticus, supinators, rhomboids, spinati and coraco-brachialis. That from the sixth cervical root feeds the pronators, the radial extensors, the serratus magnus and the clavicular portion of the great pectoral muscle. The seventh cervical root corresponds to all the muscles supplied by the musculo-spiral and the sterno-costal portion of the pectoralis major, as well as to the triceps, the extensor carpi ulnaris, and the extensors of the fingers. The supply from the eighth cervical goes to the flexors of the fingers and wrist, while that from the first dorsal goes to the intrinsic muscles of the hand. Expressed in terms of movement, the roots of the plexus are set in activity as follows: Flexing of the elbows is carried out by the fifth cervical, extension of the elbow by the seventh, pronation of the hand by the sixth, supination of the hand by the fifth, flexing of the wrist by the eighth, and extension of the wrist by the seventh.

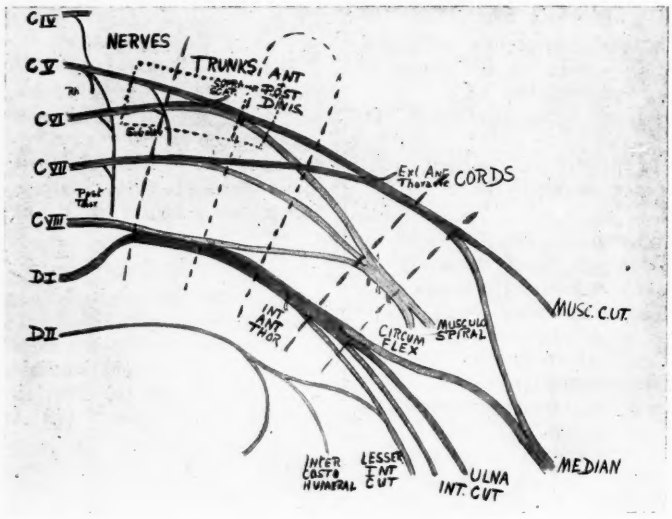

Fig. 1.
Diagram of the Brachial Plexus, Modified from Cunningham.

(*b*) Much less is known in regard to the sensory supply. The cervical roots entering into the brachial plexus overlap to such an extent that they have no exclusive supply, and it is possible to divide the anterior primary divisions of fifth, sixth and seventh cervical nerves containing cutaneous fibres without producing any demonstrable sensory lesions. The well known figures of Thorburn, Kocher and Head were obtained by various methods, and probably indicate the full protopathic areas of supply.

(*c*) Sympathetic.—The white rami from the upper dorsal nerves contain the following fibres: (1) Oculo-pupillary fibres, supplying the dilator pupillæ, the nonstriated part of levator palpebræ superioris, and the orbital muscle of Müller, bridging across the sphenomaxillary fossa; (2) sweat fibres, supplying the side of the face and neck, except a small patch below the inner canthus, the upper limb, and upper part of the trunk; (3) vaso-motor fibres to face, neck, arm, and tongue; (4) pilo-motor, having a similar distribution, and (5) secretory fibres, *e.g.*, to the sweat and sub-maxillary glands.

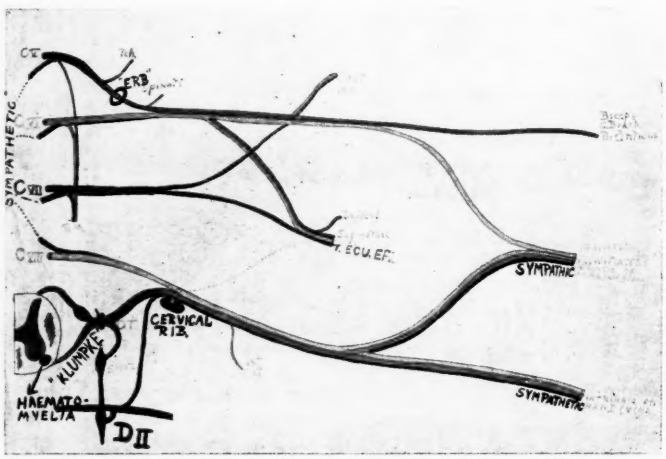

Fig. 2.
Diagram of the Motor Root Distribution, Modified from Kocher.

The erroneous supposition that the sympathetic fibres make their way to the periphery of the arm along the sheaths of the arteries has been emphasized by Langley in the case of both pilo-motor and vaso-motor nerves. According to this author, they are given off from the sympathetic chain, and run with the individual nerves of the arm. But there is considerable variation in the origin of the twigs from the nerves and the site at which they reached the arteries.

Kramer carefully worked out the anatomy of the vascular twigs of the arteries of the arm. He found that whilst the subclavian artery immediately adjacent to its origin was supplied by twigs from the *ansa subclaviae*, the remainder of the subclavian artery and the proximal part of the axillary artery

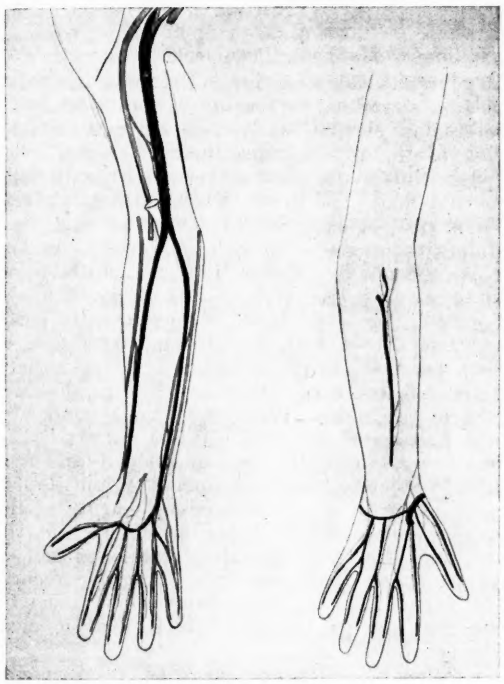

Fig. 3.
Diagram of the Vascular Nerves of the Arm, Modified from Kramer.

were supplied directly by a twig from the sympathetic chain.

The brachial artery is supplied by a number of twigs from the musculo-cutaneous nerve, and occasionally from the median. The radial, ulnar and anterior and posterior interosseous arteries are supplied by their accompanying nerves. While the superficial palmar arch and the digital vessels have a complicated supply from the median and ulnar vessels, the deep palmar arch is supplied by twigs from the deep branch of the ulnar nerve; the dorsal carpal arch is supplied by twigs from the radial nerve, and the posterior branch of the ulnar.

C.—Variations.

Certain variations in the brachial plexus may occur, through the plexus being prefixed or post-fixed; that is, the root supply of a muscle may vary in relation to the vertebral column. The prefixed type is the commoner, and here the plexus receives a large branch from the fourth cervical and a minimum from the first and second dorsal nerves, and conversely. In the case of a post-fixed plexus, there is no branch from the fourth cervical, and the roots at the lower end of the plexus are of large size.

D.—Brachial Plexus Injuries.

For the purpose of classification, the cause of surgical affections of the brachial plexus may be divided into three groups, *viz.*, trauma, traction injuries, and pressure injuries.

(*a*) *Trauma.*

Trauma may be direct, penetrating or gunshot, or indirect, fracture of the cervical spine or clavicle

Fig. 4.
Diagram of the Sensory Root Distribution of the Brachial Plexus (after Thorburn). The hands represent one of the forms of Anæsthesia caused by Cervical Rib.

Taylor, in 1903, reported 10 cases of fracture of the clavicle, with brachial plexus injury, but in the majority the injury was due to the violence producing the fracture and not to laceration of the nerve by the broken end of the bone.

(*b*) *Rupture of the Nerve Trunks.*

Rupture of nerve trunks may lead to paralysis of the upper arm type. In Duchenne's obstetric palsy or Erb's paralysis, the loss of power corresponds to the distribution of the fifth cervical nerve. This may occur in three ways:—

Firstly, the head and shoulders become separated, for example, in falls, and the anterior primary division of the fifth cervical nerve becomes overstretched.

Secondly, in parturition, pulling on the head with obstruction at the shoulders, or *vice versa*, may give rise to the so-called obstetric form. In this accident, the presentation is a vertical one in 50% of the cases and a breech one in 46%. The left arm is usually involved.

In the third place, the weight of an unsupported, abducted and externally rotated arm may cause overstretching of the brachial plexus, *e.g.*, in breast operations. This form is known as post anæsthetic variety.

Paralysis of lower arm type (Klumpke) occurs when the loss of power corresponds to the distribution of the first dorsal nerve, *e.g.*, when the patient, in falling, clutches at some object, and the first dorsal nerve becomes overstretched, or in the obstetric form, when the breech is pulled on with the arms extended, leading to the overstretching of the first dorsal nerve.

(*c*) *Pressure on Nerve Trunks.*

Paralysis may be caused by the pressure of a cervical rib on the various nerve trunks. Under rare conditions, the nerve trunks may be subjected to pressure by tumours, and lose their function.

In order that the surgical aspect of injury to the brachial plexus may be rendered quite clear, it is necessary to distinguish various types. In 75% of these injuries, paralysis of upper arm type is met with. As I have already stated, Erb's paralysis and Duchenne's obstetric palsy are the commonest forms of this type.

Paralysis of the lower arm type, so-called Klumpke's paralysis, is less frequent and is present in about 15%. Apart from these, there is an intermediate type, in which the seventh cervical, and, at times, the sixth and eighth anterior primary divisions are affected.

Among the infraclavicular injuries to the brachial plexus, the trauma may affect the outer cord, the posterior cord, or the inner cord. Of the resulting paralyses, obstetric palsy or Erb-Duchenne palsy in which there is a lesion of the anterior primary division of the fifth cervical nerve, and paralysis due to cervical rib, in which there is a lesion of the anterior primary division of the first dorsal nerve, are sufficiently common to deserve full consideration. The remainder are only worthy of a passing word.

E.—Erb-Duchenne Paralysis.

This condition was first described by Smellie, in 1768, but our present knowledge dates from 1872, when Duchenne, in his work, *De l'Electrisation Localisée* (1872), under the heading of *Paralysis obstetricales infantiles du membre supérieur sans complications*, described four cases of this paralysis occurring in infants. It was not until 1874 that Erb described the same paralysis in adults. It is estimated to occur in 1 in 2,000 births (Frauenthal), but this is probably too low.

This paralysis is usually caused by the forcible separation of the shoulder from the head and neck. This may occur in labour through too forcible traction on the head when the shoulders are impeded, or when too great traction is put upon the shoulders to deliver the after-coming head in the breech presentation. The more suddenly the force is applied, the greater the probability of the roots being torn across, instead of being merely stretched or contused. With a lesion of the anterior primary division of the fifth cervical root, however, two of the fundamental rules regarding nerve injuries are broken, for (1) the anterior primary division of the fifth cervical nerve can be divided, and no sensory disturbance demonstrated; and (2) if one-third of the anterior primary division of the fifth cervical be divided, paralysis ensues. This is contrary to what is usually observed in a mixed nerve. In this situation the nerve branches are arranged in bundles, and this explanation holds good for cases of incomplete Erb's paralysis. Division of one-third of the nerve trunk is comparable to complete division of one of these branches.

Theories of Erb-Duchenne Paralysis.

The generally accepted view is that obstetric palsy is due to a stretching or tearing of the upper roots of the brachial plexus. At first, the anterior primary division of the fifth cervical nerve becomes taut, and when this is stretched or torn, the strain falls on the root below, and so on. The condition is therefore a primary paralysis. In favour of this view the following evidence may be adduced. As has been pointed out by Warren Low, the distribution of the paralysis corresponds to that of the fifth cervical nerve. The seat of the lesion is usually localized at operations or in the post mortem room in the fifth cervical nerve. It has been found experimentally that traction to the head when the shoulder is fixed in the cadaver produces tension, and subsequent tearing of the fifth cervical nerve.

This view has recently been questioned, and it is thought by some to be due to a primary joint lesion. Pressure at birth is said to produce tearing of the capsule or sub-luxation of the shoulder; and the contraction of the inflammatory tissue causes an internal rotation of the humerus (Lange). According to Turner Thomas the inflammatory tissue involves the brachial plexus, which lies in close proximity.

The following facts are regarded as favouring Thomas's theory: (*a*) A bent-down condition of the acromion process is associated with many of these cases. (*b*) The lesion is usually right-sided; this corresponds to the anterior shoulder in the majority of labours. It may be pointed out that this is not proven. (*c*) There is little or no wasting of the paralysed limb.

Very similar to this is Vulpius' theory, that the condition is due to a primary bone lesion. The traction is said to produce a fracture or a separation of the upper epiphysis of the humerus, and this is followed later by union in the dislocated position.

In rare and slight cases the lesion may possibly be due to the direct pressure of the accoucheur's fingers or of the edge of the blade of an obstetric forceps on the nerve roots.

Erb-Duchenne paralysis was formerly thought to be due to a pinching of the brachial plexus between the clavicle and the first rib, but Taylor proved

that pressure, exerted either by the clavicle or by the first rib could not produce this lesion.

Pathology.

The literature relating to the pathological changes found in Erb-Duchenne paralysis is very scanty, but, nevertheless, two definite and distinct types of lesions can be recognized. The more common one consists in a lesion of the upper roots of the brachial plexus, and in the rarer type there is a complete or partial evulsion of these roots from the cord. In the first type, in which there is a lesion of the upper roots of the brachial plexus, the changes found after the injury varies according as to whether the injury is slight or severe. In the slighter cases a rupture of the perineural sheath round the nerve funiculi is met with, and the laceration of the blood vessels running in this sheath leads to hæmorrhage into the substance of the nerve (Horsley and Prout), with a consequence tearing apart of the nerve funiculi. The prognosis therefore will depend on the extent of the hæmorrhage. The deep cervical fascia, which lies just in front of the nerve roots, frequently tears, and, on healing, leaves a thickening at the site of the tear. The inflammatory tissue may become adherent to the nerve cicatrix.

In the severer cases of Erb-Duchenne paralysis a partial or complete severance of the nerve fibres occurs. The fibres give way at different levels (like a rope on breaking), and in the process of healing, this leads to a excessive formation of fibrous tissue. The fibrous tissue contracts at a later date, and not only prevents nerve regeneration, but presses on and may destroy the fibres which have escaped. The cicatrix formed from the plastic material thrown out as the result of the injury may occur at any place between the spinal cord and the place where the final nerve trunks are given off from the cords of the plexus. It is usually situated in the fifth root, just above, just below, or at its junction with the sixth cervical root. The scar may be localized to one side of the nerve root, may extend right through the nerve, or there may be several cicatrices scattered along the root, or even one large cicatrix, involving practically the whole root.

In the rarer type, where there is a complete or partial evulsion of the fifth and sixth nerves from the spinal cord, the condition found at autopsy is as follows: The spinal meninges over the affected area are thickened, fibrous and adherent to the cord. The affected side of the cord is found to be smaller than normal. The injured areas of the cord are invaded by fibrous tissue. The anterior horn is more or less distorted, and the cells are reduced in number, and show various stages of degeneration, while the adjacent tracks are more or less damaged. The anterior and posterior roots, as well as the brachial plexus on the affected side, are smaller than normal, and there is a reduction in nerve fibres. Finally, changes take place in the cerebrum, analagous to those found after amputation, namely, a reduction of the Betz cells and a gross lesion of the fibres in the motor, intermediate, and precentral area.

In the latter type there is usually a history of difficult and protracted labour and asphyxia, in which resuscitation is especially difficult, probably due to interference with the neighbourhood nuclei of the phrenic nerve from hæmorrhage and trauma to the cord. Clinically, the cases may resemble a classical case of Erb-Duchenne paralysis closely, but in the most severe cases cord symptoms may be superadded till the picture of hæmatomyelia is produced. This occurred in Raymond's case—a double Erb-Duchenne paralysis, with a spastic gait, etc. The findings in certain cases that have been operated on strongly suggest that extra-spinal and intra-spinal lesions may occur in different roots of the same plexus.

The muscles found to be commonly affected in 45 cases of Erb-Duchenne paralysis were the spinati, deltoid, teres minor, biceps, coraco-brachialis, brachialia-anticus and the supinator longus and brevis, and only in rare instances were the teres major, serratus magnus or subscapularis involved.

The former represent the muscles supplied by the fifth root. The same group of muscles can be put into action in health by faradizing Erb's motor point, which lies two fingers' breadth above the clavicle and one finger's breadth behind the sterno-mastoid, and corresponds to the union of the fifth and sixth anterior primary divisions. Following on the paralysis associated with the nerve lesion, certain associated conditions may occur. The same occurs in infantile palsy; there is a lack of growth of the upper extremity and shoulder girdle, and the bones do not develop properly.

The clavicle, scapula and humerus all remain small. The coracoid is often bent downwards and forwards, forming a beak, which is said to press upon the head of the humerus in some cases. The glenoid cavity remains small, and this, together with the infantile type of the upper end of the humerus, lessens the stability of the joint. Just as in club foot the constant maintenance of the limb in a faulty position causes the bones and joints to develop abnormal shapes and functions, these defects, after nerve regeneration in a neglected case, may form serious obstacles to normal function.

Morbid Physiology.

The lesion is generally ascribed to a pathological increase in the distance between the tip of the shoulder and the head in delivery. If the anatomical relations of the cervical spine, shoulder and the roots of the brachial plexus as they run obliquely across the root of the neck, be examined, it is evident that if a forcible separation be produced, the strain falls first upon the upper roots of the plexus, and then, as these stretch or tear, upon the next lowest, and, so on, until the entire plexus is ruptured. This can be demonstrated in infants by pressing the shoulder until the upper cords stand out. Furthermore, Bailey demonstrated that 30° was the limit of lateral flexion of the head that could be obtained without endangering the upper roots of the plexus.

Carter has expressed the opinion that stretching or rupture of the upper roots of the brachial plexus

during delivery is the only cause of obstetric palsy. In rare instances, however, the effect of traction extends to the cord itself. This was first pointed out by Burr. The pathology of one of these cases was described very fully by Boyer. Boyer demonstrated in the newly-born infant that if traction be exerted on the arm in a downward direction, the fifth and sixth cervical roots become taut; but if the traction be applied at right angles to the body, the middle roots of the brachial plexus becomes stretched, and when the strain is increased, evulsion of the anterior and posterior roots can be produced. The maximum effect falls on the seventh and eighth cervical levels.

(To be continued.)

LEGAL STANDARDS FOR INFANTS' FOODS.

By **H. G. Chapman, M.D., B.S.**

[*From the Physiological Laboratory of the University of Sydney.*]

It has been found that infants fed on human milk are more likely to survive than those fed otherwise than from the breast. Not only is the rate of mortality less among breast-fed children than among hand-fed infants, but the incidence of diseased conditions is greater among those fed on foods not derived from human mammary glands. The medical profession has recognized these facts and advocated that the mother should feed her child whenever it is possible. Many mothers are unable to provide sufficient nourishment for their infant, so that it is necessary to supply additional food to the infant. Some mothers do not feed their infants at all, and the children are nourished entirely by what are known as "artificial foods."

It is the custom to regard the method of feeding on the breast as physiological, and to endeavour to approximate to these conditions of feeding when other modes of nourishment are adopted. If the conditions of suckling of infants are examined, attention may be directed to the amount of milk taken by the child at each meal or during each day, and to the composition of this milk. It is only when these data have been ascertained that it will be possible to determine the amount and kind of material that should be supplied in the place of human milk. When search is made for these data, it is remarkable how little information is available in the literature. It should be quite easy with the aid of such a simple instrument as a pair of scales to determine how much milk infants take in each twenty-four hours or at a meal. I have not been able to obtain any data whatever as to the amount of milk taken at any time during the first six months of life by infants born in New South Wales. If recourse be made to data collected in other parts of the world, it is surprising to find how few measurements have been made. Great variations appear in the results of different investigators. As this matter is of importance to every person in the State, it should be useful to know how much food is taken by a thousand infants during each week of their period of suckling. These figures should then be examined by a simple statistical method to determine whether there is any constancy in the amount taken each day by infants of the same age. As far as I can ascertain, infants do not take less than 400 c.cm. or more than 2,000 c.cm. of milk in the twenty-four hours during the fourth week of their life. This range is so wide that without a sufficient number of figures no very definite conclusions are possible.

The composition of human milk has been examined more frequently than the quantity of the fluid secreted has been measured. In Australia, very few data are available. Mr. Wardlaw has presented us with a series of figures on the amounts of the various components in human milk during the early days of lactation. We require similar series for the milks of mothers at the third, sixth and ninth months of lactation. It may perhaps be necessary to make even more frequent examinations if the composition of milk shows any periodic variations during the course of the lactation.

Mr. Wardlaw's data are of value for computing the composition of milk in the early days of lactation, but his method of examining his results may be applied to other series of analyses of human or animal milk. It is remarkable how few series of analyses of human milk have been made. I have only been able to find four series in which more than fifty samples of human milk have been analysed with the object of obtaining more or less roughly the quantities of the chief constituents, recorded in the literature of the last thirty-five years.

When the simple statistical method used by Mr. Wardlaw is applied to the figures found in the papers recording the results of these series of analyses, they show that the general characters of the results obtained by Mr. Wardlaw are still evident. It becomes apparent that the constituents of human milk may be classified into two groups. The first group includes the solids not fats. These substances are secreted as the result of a mechanism, which is of such a kind that the amounts of these bodies are approximately constant in all milks. This mechanism, no doubt, is in part similar to that which brings about the approximately constant molecular concentration of the blood serum in all women. The second group includes the fats. The variations in the quantities of fats in human milks show that the mechanism leading to the passage of fat in milk is of such a nature that great variations in the amounts of fats become possible in the milks of different women. It is evident, therefore, that different infants fed on the breast will receive milks with approximately constant concentrations of solids not fat, but with very different concentrations of fats.

It is now advisable to consider the conditions of growth in the infant. The human infant increases in weight slowly. The infant doubles its weight in about 200 days. It weighs 2 to 5 kilos at birth, so that it increases in weight by 2 to 5 kilos in 200 days. This increased weight involves the addition of from 1.3 to 3.3 kilos of water and 0.7 to 1.7 kilos of dry solid matter. It has been pointed out that the infant takes from 400 c.cm. to 2,000 c.cm. of milk each day as food. This contains from 40 gm. to 200 gm. dry solid substance. In 200 days the infant receives from 8 to 40 kilos of solid matter. It is obvious that the infant only uses about one-tenth of its solid food for building its tissues. The

remainder of the food is used to heat its body. The infant differs in this way from many animals, in which a greater proportion of the food is used for the formation of the permanent structures of the animal. It has been found that the rate of growth is determined in animals by the character of the various constituents of the food, and especially the kinds of amino acids available in consequence of the digestion of protein. To attain a rapid rate of growth an animal must receive such amino acids in its food, that each of the requisite acids needed for the manufacture of its body proteins is present in sufficient quantity.

The useful infants' foods prepared by manufacturers may be divided into four groups: (1) dried cows' milks, in which the solids of the milk are presented in a finely divided form; (2) dried cows' milks to which additional fat has been added; (3) mixtures of dried cows' milk, with preparations of various cereals, in which the starch of the grain is more or less completely converted into maltose and glucose; and (4) preparations of cereal grains subjected to various kinds of digestive treatment. It is probable that all these foods have a useful place as substitutes for human milk, but are subject to the limitations already mentioned.

The Acts which are in force in Australia all lay it down that the composition of infants' foods must be such that when prepared as directed for consumption, they shall approximate in composition to human milk. In the administration of these Acts, difficulty has been experienced. Regulations are required to enable the administration of the Acts to be carried out satisfactorily. These regulations set out a standard for the composition of human milk and a certain degree of variation on the standard is permitted.

As there are six States in the Commonwealth, and as each can have a different regulation, attempts have been made to secure uniformity through the intervention of the Commonwealth. The Commonwealth authorities have proposed a standard with a deviation of 30% either way from it.

Such a standard assumes a degree of rigidity in the composition of human milk fit for consumption by infants which is not in accord with the data available. If this standard was applied to the milks of Australian mothers, then 60% of the milks would be condemned as not fit for consumption. Yet the infants thrive on these milks. The difficulty arises from the fact that the standard lays undue stress on the relative concentration of the various constituents, while the nutrition of the infant is determined by the quantity of food consumed. Again, the standard insists on a particular ratio between fat and sugar, while actually these substances can replace one another in the production of the heat of the body.

All those foods composed of milk and digested cereal have too high a concentration in sugar as compared with fat when judged by the canons of the proposed standard. Experience has taught us that these foods are well borne by the infant. The variety in the amino acid is probably an advantage to the growing infant. It is therefore urged on the health authorities that, until definite information of the harmful character of these preparations is produced, a larger deviation from the standard be permitted, so as to allow those foods in which the heat energy is derived from carbohydrate to be sold without a special label. Such foods contain a high percentage of carbohydrate and a low percentage of fat. In the standard the ratio of carbohydrate to fat is roughly 2:1, while these foods mostly contain four part of sugar to one of fat. This range is no greater than that found in the milk of many Australian mothers. In these foods most of the starch is converted to sugar, and the standard should determine the maximal amount of starch to be permitted. It is difficult to convert the last traces of starch, so that an absolute prohibition of starch is unnecessarily severe. An amount not exceeding one per cent. of the food would be quite harmless. If the deviation allowed was extended to 50%, then the regulation would be more in accord with the degree of variation present in the food of breast-fed infants.

Reviews.

TUBERCULOSIS.

In his scheme[2] for dealing with the tuberculosis problem in London, Dr. Barty King has given us the result of two years' arduous work in an endeavour to arrive at a satisfactory method of procedure in dealing with patients suffering from tuberculosis of the lungs in various stages. He rightly points out that the campaign against tuberculosis is a national one, and that a Government Department should be established for organizing the work throughout the country. This should be accomplished by the formation of a Ministry of Public Health, with a central department for dealing with tuberculosis. As Sir William Osler says in the foreword, on paper the problem of tuberculosis looks simple enough, for it includes the provision for healthy environment, good housing and proper food for all; the recognition of the disease in the early stages, and the putting of the patient in the best possible circumstances to procure a cure; and the guarding of the country against dangers associated with advanced incurable cases. But though this appears so simple on paper, it becomes extremely difficult when one attempts to work out a comprehensive scheme which will effectually deal with all phases of the question. The scheme which Dr. King has proposed for the County of London is complicated, yet it is an honest attempt to deal with an admittedly difficult problem. It will need careful engineering to enable it to be put successfully into practice. The conditions in Australia and in London are, on the surface, different enough, but we are all faced with somewhat similar difficulties, and a study of this scheme should lead us to a better understanding of some, at any rate, of the phases of the tuberculosis problem. We can heartily commend it to the study of those who are specially engaged in tuberculosis work.

ANALYTICAL CHEMISTRY.

The tenth edition of "Muter's Analytical Chemistry"[1] has been edited by Mr. J. Thomas, a member of the staff of the London School of Pharmacy. The edition has been issued to incorporate the changes in standards introduced by the British Pharmacopœia, 1914. An endeavour is made to give, in some two hundred and thirty pages, an account of analytical chemistry, both qualitative and quantitative. The

[2] Scheme for Dealing with Tuberculous Persons in the County of London: Its Application to other Cities, with some Observations on the National Organization of the Campaign Against Tuberculosis, by D. Barty King, M.A., M.D., Edin., M.R.C.P., Lond. and Edin.; with a Foreword by Professor Sir William Osler, Bart., 1915. London: John Bale, Sons and Danielsson, Ltd.; Royal 8vo., pp. 54, with 14 charts. Price, 6s.

[1] Muter's Short Manual of Analytical Chemistry, Qualitative and Quantitive, Inorganic and Organic, by J. Thomas, B.Sc.; Tenth Edition, 1915. London: Baillière, Tindall & Cox; Royal 8vo., pp. 237, with 56 illustrations. Price, 6s. net.

information is expressed in brief, concise and clear language. The directions are all practical, as the author intended the student to work through the book in the laboratory. Whoever conscientiously carries out this task will acquire an invaluable grounding in chemical methods. The range covered by the various chapters is so extensive that the time needed by collegiate, pharmaceutical and medical students to complete the course in a laboratory would amount to some years. It is also noted that, although the exercises are graded to some extent by the arrangement of the book into two sections, on qualitative and quantitative analysis respectively, the technical skill demanded in the earlier lessons is on the same level as that sought for in the later lessons. If the student's technical skill is to be improved during his course, he would require much practical instruction from his teacher, supplemental to that given in this manual.

The book will be found useful to the more advanced chemist as a handy work of reference for tests and methods in organic and inorganic technical analysis. To the student preparing for an examination, the large amount of information so well expressed and classified will make it an attractive publication.

Public Health.

THE HEALTH OF VICTORIA.

The following notifications have been received by the Department of Public Health, Victoria, during the week ending September 30, 1915:—

	Metropolitan. Cs.	Dths.	Rest of State. Cs.	Dths.	Totals. Cs.	Dths.
Diphtheria	44	1	13	0	57	1
Scarlatina	8	0	4	0	12	0
Enteric Fever	1	0	3	0	4	0
Pulmonary Tuberculosis	24	5	8	4	32	9

The following is a return of the cases of epidemic cerebro-spinal meningitis notified to the Board during the week ending September 30, 1915:—

	Metropolitan Area. Cases.	Rural Districts. Cases.	Totals. Cases.
Military	—	—	4
Civil	15	2	17

THE HEALTH OF NEW SOUTH WALES.

The following notifications have been received by the Department of Public Health, New South Wales, during the fortnight ending September 27, 1915:—

	Metropolitan Combined Districts. Cs.	Dths.	Hunter River Combined Districts. Cs.	Dths.	Remainder of State. Cs.	Dths.	Total. Cs.	Dths.
Enteric Fever	31	1	2	—	12	—	45	1
Scarlatina	177	3	6	—	96	2	279	5
Diphtheria	96	5	4	1	65	2	165	8

SMALL-POX IN NEW SOUTH WALES.

The following cases of small-pox have been reported to the Department of Public Health, New South Wales, during the week ending October 3, 1915:—

	Cases.
Country—	
Newcastle and Surrounding District	24

INFECTIVE DISEASES IN QUEENSLAND.

The following notifications have been received by the Department of Public Health, Queensland, during the week ending September 25, 1915:—

Disease.	No. of Cases.
Varicella	33
Diphtheria	32
Pulmonary Tuberculosis	15
Enteric Fever	11
Scarlatina	5
Cerebro-Spinal Meningitis	2
Total	98

INFECTIVE DISEASES IN WESTERN AUSTRALIA.

The following notifications have been received by the Department of Public Health, Western Australia, during the week ending September 11, 1915:—

District.	Enteric Fever. Cases.	Diphtheria. Cases.	Scarlatina. Cases.	Pulmonary Tuber'losis. Cases.	Erysipelas. Cases.
Fremantle	—	3	—	—	—
Fremantle East	—	1	1	—	—
Fremantle North	—	1	—	—	—
Subiaco	—	1	—	—	—
Perth	1	1	—	—	1
Maylands	—	1	—	—	—
Bayswater	1	—	—	—	—
Guildford West	—	1	—	—	—
Victoria Park	—	1	—	—	—
Kalgoorlie	—	4	—	4	—
Boulder	—	—	—	2	—
Gosnells	—	—	—	1	—
Northam	—	1	—	—	—
Totals	2	15	1	7	1

Vital Statistics.

SOUTH AUSTRALIA.

The returns of births and deaths registered in South Australia during the month of August, as well as those for the city of Adelaide, have been published in the *South Australia Government Gazette* under date of September 16, 1915.

There were 975 births registered in the State during the month, which is equivalent to an annual birth-rate of 26.5. This rate is considerably lower than the birth-rate in August during the preceding five years. The rate was highest in 1914.

Over 10% of the deaths affected infants under one year of age. There were 42 deaths in this class. The total number of deaths from all causes was 415, and the death-rate was equivalent to an annual death-rate of 11.28. As is usual in Australian States, the number of deaths of persons over 60 years of age formed a considerable proportion of the whole. There were 183 persons of 60 or over who died, and if this number be added to the 42 infants, it will be seen that over 50% of the deaths fell into the two classes. Only 112 deaths of persons between one year of age and 40 years of age were recorded.

The causes of death are tabulataed in the usual manner, according to the grouping of Bertillon. Organic diseases of the heart killed 56 persons, acute endocarditis killed 5, cerebral hæmorrhage killed 13, and other diseases of the circulatory system killed 14. The total number of deaths due to affections of the cardio-vascular system, therefore, amount to 88.

The next most frequent cause of death was malignant disease. There were 32 deaths from this cause. Tuberculosis was fatal 30 times, pneumonia 29 times, bronchitis 19 times, and Bright's disease 21 times.

It is unfortunate that meningitis is entered as a cause of death without any indication of the form. Presumably, the larze number of deaths, *viz.*, 18, include those due to epidemic cerebro-spinal meningitis. It appears that from January 1 up to September 21, 1915, there were 31 deaths from the last-named disease. There were 5 deaths from morbilli, 4 from diphtheria, 3 from enteric fever, 6 from diarrhœa and enteritis, and one each from influenza and erysipelas.

The returns for Adelaide reveal the following facts: The number of births during the month was 91, which is equivalent to an annual birth-rate of 25.1. This rate is low as compared with the rate in Adelaide during the preceding five years.

There were 117 deaths during the month, 5 of which were of infants under 1 year of age, and 39 of persons over 60. The corrected death-rate, expressed as an annual death-rate, works out at 19.08 per 1,000 of population. Of the 15 deaths due to meningitis registered in the city, only 3 affected persons usually resident within its confines. The other causes of death do not call for any special mention, save perhaps that there were no cases of fatal diarrhœa or of dysentery.

The Medical Journal of Australia.

SATURDAY, OCTOBER 9, 1915.

The Chemistry of Human Milk.

According to the dogmatic teaching of the older text books on physiology, human milk is a secreted fluid possessing very definite characters and having a readily definable constitution. In 1888, Michael Foster, in his excellent book, gave the following description of the secretion of the human mammary gland: It is a fluid with a specific gravity of from 1028 to 1034, is slightly alkaline, and contains 26.66 parts of fat, 43.64 parts of sugar, 39.24 parts of casein, and 1.38 parts of salts in each 1000 parts of milk. The total solids represent 110.92 parts and water 889.08. It is somewhat extraordinary that these figures should have been quoted without any mention of variations or modifications, since up to that time the analyses available did not agree very well with one another, and further, it must have been obvious to every physiologist that the methods of estimating the constituents were not entirely satisfactory.

In the interval very little work has been done to ascertain the composition of human milk. It appears to have been assumed that the results of previous analyses were accurate, and one fact has been entirely overlooked, namely, that considerable variation exists in regard to several of the constituents. It has occurred to Dr. H. G. Chapman that much minuter knowledge was required before we would be justified in teaching students the physiology of milk. He therefore set Mr. Halcro Wardlaw the task of analysing in a systematic manner the milk of mothers at different periods of lactation. In this issue we publish a resumé of the results of this investigation in so far as the first week of lactation is concerned, together with a communication by Dr. Chapman on the Legal Standards for Infants' Foods and the discussion which followed the reading of these two papers. The announcement that Mr. Wardlaw will continue his investigations and control the composition of human milk at other periods of lactation has been made. Some time must elapse before these results, obtained from a large number of samples, will be available, but in the meantime there are certain data from which it is possible to draw important conclusions.

With the exception of the solids other than fat, no figure can be quoted as representing a normal or standard for all mothers. In the case of sugar, the variation, although considerable, certainly shows some tendency toward a definite concentration; this is less marked in the case of proteins. Leaving the question of fat out of consideration for the moment, it may be asked what is the significance of the variations. Mr. Wardlaw has stated that the only factor which appeared to have any influence on the figures was the age of the mother, although this influence was not a marked one. Observers of Nature have recognized for a long time that she has an extraordinary facility for meeting individual cases and for adjusting the quantity and quality of a supply to the demand. Experience teaches that save under exceptional conditions, mother's milk safeguards the infant from the manifold noxes of life. Even when the mother herself is undernourished and is exposed to dangers arising from lack of means, squalor, dirt and mental strain, the infant thrives in a surprising manner. Dr. Chapman has demonstrated that the infant during the first 200 days of life only demands one-tenth of the available nitrogenous material for its nutrition. It would therefore seem as if Nature, ever extravagant, supplied the infant with an excess of foodstuffs in an ordinary, natural diet, from which the requirements of growth and energy could be supplied under the most varying conditions. It would be expected that when the functions of the mother's tissues are impaired by external influences, the different constituents would vary considerably, according to the forces at play. The lessons to be drawn from these considerations would be that it is of little importance what the concentrations of the carbo-hydrates and proteins are, provided that these two classes are represented, and their caloric value is ample for the child's needs.

In respect of fat, it would seem that Nature has made a successful attempt to distinguish between the source of heat to be used up as energy and the source destined for the building up of the body. Fat is required largely for the former, and the fact

that a very wide variation exists in its concentration suggests that this constituent is supplied according to the demand of the infant, rather than according to the unconscious calculations of the physiology of the mother. It might be worth while making a parallel estimation of the concentration of fat in the mother's milk and of the amount of heat evolved by the muscular action of the infant. If this surmise be correct, a lively child who spends a great part of the day in active movement would demand and obtain more fat from its mother than a placid infant, who sleeps the greater part of the 24 hours.

Fat, sugar, proteins, salts and water do not exhaust the list of the constituents of human milk. Little is known of the ferments of milk, of the vitamines, and of the various antibodies or ferment-like characters. But in spite of this want of knowledge, these properties or constituents are of great importance. "Dead" milk cannot be compared with "live" milk as an infant's food. We would therefore urge that women should be induced to nurse their infants under all conditions. Failure is very rarely due to incapacity; it is usually due to want of goodwill or deficient patience. When artificial foods must be given, the doctor should attempt to imitate Nature, and vary within wide limits the constituents of the food to suit a given baby. It would therefore seem that the rigidity of standards set up by the authorities is unjustifiable, and may be even harmful. At most this rigidity would enhance the sale of a few foods, and would not effect an increase in the number of women who nurse their babies.

CONTROL OF VENEREAL DISEASE.

A Bill to amend the Health Act, 1911-1912, of Western Australia is being considered by the two Houses, and calls for careful consideration of the medical profession throughout the Commonwealth. After the passage of the Bill, a brief account of the debates in both Chambers, together with the text of the Bill and of the amendments, will be published in these columns. The Bill has passed with but little debate and few amendments through the Legislative Assembly, but there is reason to anticipate considerable alteration during its passage through the Council. The Western Australian Branch of the British Medical Association has considered the provisions of the Bill, and has arrived at the conclusion that many amendments are needed, although the general basis of the measure has received their approval. Dr. Saw delivered a very able speech during the debate on the second reading on September 28, 1915, and has indicated some of the amendments which will be needed to make the Bill a really useful one. His condemnation of the undue haste with which it was pressed through the Assembly will receive general acquiescence.

The Bill provides for the treatment of venereal diseases exclusively by medical practitioners; persons suffering from these complaints will be forced to submit to treatment until a clean bill of health is given by the doctor. Various provisions are included in regard to the machinery for keeping the patients under treatment, and anonymous notification is to be adopted. Moreover, it is proposed that should the patient absent himself from the practitioner for a period of six weeks, and no notice be received from another practitioner that the same patient has placed himself under the care of the latter, the name and address of the patient shall be disclosed to the Commissioner of Health. The penalties for failing to notify are much too heavy, and it would be well if the medical profession were to consider with especial care whether the onus of reporting the facts should fall on the practitioner.

The proposals in regard to persons suspected of venereal diseases in an infectious stage are most drastic, and will meet with much opposition. Powers are to be granted to the Commissioner to cause suspected persons to be examined by a Medical Officer of Health, or by two medical practitioners under warrant, and if the person be found to be suffering from a venereal disease the Commissioner may issue a warrant for his arrest and detention. Objection may be taken to these provisions on the ground that the liberty of the individual is restricted, that considerable powers are placed in the hands of the Commissioner, the Medical Officers of Health and of medical practitioners, and lastly that innocent persons might be subjected to treatment in an unjustifiable manner. As far as the first objection is concerned, it must be remembered that a person who

is suffering from venereal disease is a danger to the community, and the axiom that dangerous persons should be restricted has obtained general acceptance throughout the civilized world. The second objection is more apparent than real, but the Commissioner or other medical men concerned might conceivably be subjected to unpleasant aspersions under this sub-clause. In regard to the third objection, the utmost caution is needed, and it is to be hoped that safeguards will be introduced to exclude persons who are innocent victims from the consequences of the provision.

The provision rendering it an indictable offence for a person knowingly to infect another person will meet with universal approval. Some modifications are needed in regard to the clauses dealing with the publications of a statement intended to promote the sale of a medicine, instrument or appliance for the alleviation or cure of venereal disease. The main provision is excellent. Statements of this kind are to be prohibited. But the saving clause, presumably intended to exempt medical practitioners from the consequence, is too elastic. The sub-clause provides that books, documents and papers published in good faith for the advancement of medical or surgical science are to be exempted. Any charlatan can claim that his publications are made in good faith and aim at the advancement of science. If the only exemptions were publications in recognized medical journals and books issued to the medical profession, a sufficient safeguard would be provided.

The Bill requires sandpapering. When the rough edges are smoothed, and the awkward angles are rounded off, a very useful piece of experimental legislation will emerge. The medical profession will watch the effect of the Act with great interest, more especially since its success will certainly be a signal for similar measures in other States.

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LABORATORY WORK IN MILITARY HOSPITALS.

The equipment of military hospitals both at the front and within the Commonwealth is improving as experience indicates the need for expansion in one or other direction. At the outset the military authority appeared to hold the opinion that buildings, beds and practitioners were all that was needed to call into being up-to-date hospitals. The question of the staffing of special hospitals for war duty will command our attention in the near future. There appears, however, to be one matter in this connexion which requires immediate attention. Through the agency of the various Branches in Australia of the British Medical Association, the Department of Defence is now in a position to utilize the resources of the medical profession to the best advantage of the soldiers. Clinicians, surgeons, radiographers and other specialists are available, and their services are being employed to good effect. But in spite of the fact that several expert bacteriologists and bio-chemists have offered their services, the Department has not hitherto seen the necessity of calling upon them to carry out the important work which they alone are capable of performing. No military hospital can be regarded as complete unless a laboratory is attached to it, and unless a bacteriologist and a bio-chemist are in charge of the department. In the case of the military hospitals associated with the training camps, the advantages of the association of skilled laboratory workers with the clinicians is evident, when it is considered that a disease like epidemic cerebro-spinal meningitis has to be dealt with. Similarly the services of the laboratory worker can scarcely be dispensed with in the base hospitals in which the returned soldiers are to receive medical and surgical attendance. If the bacteriologist and the bio-chemist are indispensable in the hospitals in the Commonwealth how much more urgent is their appointment to the hospitals at the front, where outside facilities for diagnosis work and for the preparation of the means of treatment are not available.

We would therefore suggest that the services of skilled bacteriologists and bio-chemists be secured by the Defence Department, and that both be appointed to each military hospital under the control of the Department.

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AN ALLEGED CURE FOR "GASSING."

On October 2, 1915, the daily press in Sydney published a cablegram dispatched from London on the preceding day to the following effect:—

> Miss Mary Davies, a bacteriologist, nearly lost her life in an heroic experiment to test poison as an antidote. Although previous tests on animals had proved fatal, she voluntarily infected herself for gangrene, making a deep incision in each leg. She then telegraphed to Dr. Taylor, an American scientist, who injected hydrochloride of quinine successfully. The discovery will save the lives of thousands of "gassed" soldiers.

The cable is an unsatisfactory means of conveying scientific news, and still more unsatisfactory as a medium for advertisement. In spite of the ambiguity of the cablegram, it would seem that the lady in question conceived the idea that poisoning by gas, presumably chlorine and bromine associated with some organic compound, could be arrested by the intercurrence of gangrene. Why this idea should have come to her is not clear. The cable suggests that she experimented on laboratory animals, with the result we would have anticipated, namely, that they all died. Not content with this reply to her ideas, she proceeded to make a deep incision into each of her legs, and presumably she infected the wounds with some pyogenic organism capable of

causing spreading gangrene. It may be assumed that this organism was one of the streptococci. We are not certain why the next act in the chain of events was the despatch of a telegram to an American scientist. But let that pass. The American gentleman injected quinine successfully. Or perhaps the cable was unfortunately worded, and he injected the quinine with beneficial results to Miss Davies. In any case, if she really infected herself with a deadly pyogenic organism, the chances would be a fatal result. Quinine has been tried and found to wanting in cases of pyogenic infections. We are in a considerable difficulty in tracing where the "gassing" comes in, but no doubt the cable is responsible for this omission. There is a moral to the story which the daily newspapers did not publish. It is that medical matters, and especially discoveries of importance, are never safe in the hands of a telegraph company, and it serves no useful purpose if announcements of this kind are made to the public. Incidentally, we may suggest to our contemporaries that even if Miss Davies had done what is recorded, and survived, it does not follow that any discovery has been made. A single result in science is of no significance. The unfortunate part of the story is that we do not yet know what it was that Miss Davies was trying to do.

THE SCHLINK FUND.

We have to acknowledge the following contributions to the "Schlink Fund." We should be pleased if this fund could be augmented to reach the sum of £200.

	£	s.	d.
Amount previously acknowledged	40	19	0
Dr. Clubbe, Charles P. B.	3	3	0
„ Dansey, St. J. W.	2	2	0
„ Hughes, James	1	1	0
„ Lidwill, Mark	2	2	0
„ Marks, Herbert J.	10	10	0
„ Molesworth, E. H.	1	1	0
Total	£60	18	0

VICTORIAN RED CROSS FUND.

The Honorary Secretary of the Victorian Red Cross Fund for Australia's Sick and Wounded Soldiers (Dr. W. Ernest Jones) has forwarded to us the third and final list of subscriptions from members of the medical profession in Victoria.

	£	s.	d.
Amount previously acknowledged	1,075	12	6
Dr. W. H. Barker	1	1	0
„ J. Catarinich	2	2	0
„ D. A. Campbell	3	3	0
„ R. S. Challander	1	0	0
„ A. Curtis	1	0	0
„ Godfrey	10	0	0
„ J. T. Hollow	5	0	0
„ P. Lalor	0	10	0
„ A. A. Macfarlane	2	0	0
„ Francis E. McAree	5	5	0
„ and Mrs. Arthur Morris	3	3	0
„ A. J. W. Philpott	1	0	0
„ M. A. Reid	50	0	0
„ Sutton	3	3	0
Total	£1,169	19	6

University Intelligence.

UNIVERSITY OF SYDNEY.

The Chancellor of the University of Sydney presided over a meeting of the Senate held in the Great Hall on October 1, 1915, to confer degrees on those students who had completed their courses and passed their examinations by special application, in order to enlist for service in the present war. His Excellency the Governor of the State, Sir Gerald Strickland, attended as Visitor of the University. The dais was occupied by members of the Senate, the teaching staff, the graduents and members of the University at present in military training. The body of the hall was filled by a large concourse of friends of the students proceeding to the front.

Professor Anderson, Dean of the Faculty of Arts, presented the graduates of the Faculty of Arts. Professor Peden, Dean of the Faculty of Law, said that he had no students to present, but that last year he had 108 students, of whom 28 had already gone to the front, while 16 more had handed in their names for service. Sir Thomas Anderson Stuart, Dean of the Faculty of Medicine, presented for the degree of Bachelor of Medicine 43 students who had volunteered for active service. He said in Great Britain 7,000 medical men out of 30,000 registered medical practitioners were serving with the colours. In other words, nearly one-fourth of the whole profession had enlisted. The need for medical men was great. In the Imperial Forces five medical officers were required for each thousand soldiers. When the army reached a total of three million men, about 15,000 doctors would be necessary for the treatment of the sick and wounded. In the Australian forces the proportion of medical men was somewhat less (about three for each thousand men), but even with this ratio there was great need for additional medical men. About 700 doctors had joined the forces of the Commonwealth, out of a total number on the medical registers of 2,500 doctors. This meant that one-fourth of the registered medical practitioners were serving with the soldiers. The War Office had invited the Commonwealth to send to Europe as many well-qualified medical men as possible. The Department of Defence had invited the University of Sydney to make some arrangements for meeting this demand. Certain suggestions had also been made to omit some parts of the curriculum. The Faculty of Medicine had, however, decided that it was not expedient to omit any portion of the training. What had been done was to maintain the standard of instruction intact, but, with the co-operation of the teachers and students alike, to work throughout all the holidays continuously and to compress the curriculum into a shorter time without omitting anything. By doing this those who had graduated that night had completed their course of instruction six months earlier than usual. Even the women students had volunteered, since they could take the places of those going to the front. Professor Haswell, Dean of the Faculty of Science, presented the students for the degrees in Science and Engineering.

The Warden, Mr. H. E. Barff, read the roll of honour, the audience standing in silent tribute to the dead. He then presented to the Chancellor 250 members of the University who were undergoing military training prior to leaving Australia for active service. He said that, as far as could be ascertained, the number of graduates and undergraduates on service totalled 742 men. Of this number, 328 were from the branches of the Faculty of Medicine, 193 were members of the Faculty of Arts, which included the Department of Economics, 163 were from the various departments of science and the remainder from the Faculty of Law and the administrative staff.

The Chancellor, Sir William Cullen, C.J., delivered a stirring address. He said that the staff and the students had been trying to ensure that the funds provided by the State and the generosity of private benefactors should be well and faithfully spent. He thought that the results of the training given by the University had never shown to better advantage than when the members of the University stood side by side with their fellow-countrymen. He believed that no man could ask for better comrades than our boys of every rank and class. Universities not only existed for the diffusion of knowledge, but they endeavoured to pass on the cherished traditions of manliness. Never was this more necessary than when a vicious doctrine was preached that there should be no moral law for nations.

His Excellency the Governor said that he was glad to bear testimony that the University had encouraged the

flower of its undergraduates to put patriotism first among the civic virtues.

At the meeting of the Senate held on September 6, 1915, Dr. E. A. Fairfax was appointed as Acting-Lecturer in Clinical Medicine, and Dr. M. Little part-time Demonstrator in Practical Pathology.

UNIVERSITY OF MELBOURNE.

The Council of the University discussed, at its meeting on September 6, 1915, the arrangements for carrying on the work of the Department of Anatomy. While expressing pleasure that Professor Berry was able to perform good service to the Commonwealth, some members of the Council thought that the University would suffer severely if it lost the services of the head of the Department of Anatomy. It was stated that Professor Berry was acting as Registrar of the Military Base Hospital, and that Dr. Rivett, who was Assistant Registrar, would gradually relieve Professor Berry of portion of his duties at the Base Hospital. The hope was expressed that Professor Berry would be able to devote the necessary time to his duties at the University before the beginning of the new academic year.

UNIVERSITY OF QUEENSLAND.

The Senate of the University of Queensland received at its meeting on September 8, 1915, a letter from the Eliza and Walter Hall Trust. The trustees intimated that they approved of the recommendations of the Senate in regard to the Walter and Eliza Hall Fellowships in Pure Chemistry and in Economic Biology, and in regard to the Eliza Hall School of Applied Chemistry. They forwarded a cheque for £1,075, being the endowment for the quarter ending September 30, 1915.

Hospitals.

CHILDREN'S HOSPITAL, PERTH.

The advisability of appointing as Chief Resident Medical Officer for the Children's Hospital, Perth, a medical man with considerable experience in children's diseases was brought up at a meeting of the General Committee held on September 6, 1915. Mr. Lovekin, a member of the Board, pointed out that the present system of appointing a young practitioner fresh from the University to fill the post of Chief Resident Medical Officer for a period of 12 months had certain disadvantages. Freshly qualified men could not be expected to have made a special study of this branch of medicine, and the amount of time which the honorary medical officers were able to give to any one patient was limited. He had ascertained that the Principal Honorary Officer had given 2.4 minutes per week to each patient. If an emergency arose, it should not be necessary to wait until an honorary medical officer arrived before the patient could receive treatment from a man experienced in children's diseases. He did not wish to say anything against the skill of the practitioners at present acting as Resident Medical Officers.

After an interesting discussion on the proposition, it was decided to refer the question to the next meeting of the Committee. It may be pointed out that an estimate of the amount of time spent by a given honorary medical officer in the service of the hospital patients should not be based on the number of minutes averaged to the number of patients. Every visiting surgeon or physician will give as much time as is necessary to the patients under his care, and we enter an emphatic protest against this manner of presenting the case to the public.

The Committee will consider the advisability of securing the services of a practitioner who has had at least five years' experience of pædiatrics, rather than of obtaining the services of men fresh from the University, who use their brains and their training to the best advantage of the patients. There is no doubt that experience is of great value; but it is also in the interest of the children of the Commonwealth that young men shall acquire experience in this important branch of medicine, in special hospitals, where the work is controlled and guided by a staff of practitioners who have dealt with children for a considerable period. The local and temporal conditions must be taken into account, and we hold the opinion that the body of men best able to judge this question would be the Honorary Staff of the Children's Hospital.

THE LADY BOWEN LYING-IN HOSPITAL.

The annual report of the Committee of Management of the Lady Bowen Lying-in Hospital, Brisbane, for the year ending June 30, 1915, contains a brief account of the year's work, and is supplemented by a financial statement.

During the year 671 women were admitted into the hospital. Of these 502, *i.e.*, 74.8%, were married. There were 25 patients under treatment on the last day of the previous year. In all, 584 women were confined, 11 had been confined before admission, in 17 cases a miscarriage took place, and in 76 cases the patients had been admitted for gynæcological treatment In 34 instances the delivery was effected with instruments. Of the complications, albuminuria was the most common, having been noted on 82 occasions, *i.e.*, in 11.9% of the 688 patients. Next in frequency was eclampsia, or threatened eclampsia. This occurred in 19 cases, and proved fatal in 8. No other maternal deaths took place, so that the mortality for the whole series of 584 confinement cases was 1.37%. Gonorrhœa was diagnosed four times, erysipelas once, and pneumonia once. There were six hæmorrhage cases, four accidental, and two *post partum*.

From the table it appears that there were ten twins. We assume that if this number be added to the number of confinements both before and after admission, *i.e.*, 595, the number of infants born will be arrived at. The number would therefore be 605. There were 19 still-births, *i.e.*, 3.14%, and 22 deaths of infants born alive, *i.e.*, 3.6%. Prematurity is entered as the cause of death in 13 instances, atelectasis in 3, "twins" in 2, and intestinal obstruction, hæmorrhagic diathesis, gastro-enteritis and meningitis in 1 each.

The year under review was the fiftieth of the existence of the institution. At first the hospital was small, containing but 11 beds, but in 1889 the present building was erected, and the scope of utility of the hospital was increased year by year since that date.

Of the total expenditure during the year of £2999, £1925 was expended for provisions, etc., wages and salaries. On the other side, the total receipts amounted to £3324. Of this sum the Government subsidy supplied £1308, which is equivalent to 39.3% of the income.

During the year four practitioners filled the position of medical officer. Owing to the demand for doctors for the front, difficulty has been experienced in filling the position of resident medical officer. The position was vacant on June 30.

The Matron records that 16 nurses completed their course of training. Five of these nurses hold a general certificate in addition to the obstetric certificate obtained in the hospital. Nurses pay twenty guineas for the course of twelve months. The preliminary examination prescribed by the Australian Trained Nurses' Association must be passed prior to the entry of the pupil, or the candidate must produce certificates testifying to her general education.

A correspondent send us the following note:—

A (RATHER) ROUGH TEST.

Some of our young soldiers, having been bitten and now shy, have devised a test to avoid further trouble. A few pieces—no special size mentioned— of copper sulphate are inserted into the part under test, and if no discomfort is felt the young man is so full of suspicion that he no longer pays court. On the other hand, if there is discomfort he is satisfied that all is well. What happens to the $CuSO_4$ I have not been informed. My informant is a young soldier of Don Juanistic habits, and I have no reason to disbelieve him.

"Heaven helps him who helps himself."

Abstracts from Current Medical Literature.

SURGERY.

(133) Peritoneal Exudates.

R. B. Carslaw has examined the character, significance, and prognostic value of peritoneal exudates in cases of appendicitis, perforated gastric and duodenal ulcer, tubo-ovarian abscess, and femoral hernia (*Brit. Journ. of Surgery*, July, 1915). He recognizes the following cells in the exudate: (1) Endothelial cells, (2) large hyaline mononuclear leucocytes, (3) polymorphonuclear leucocytes, with fine neutrophil granules and others with coarse eosinophil granules, and (4) lymphocytes. The mononuclear phagocytes include the endothelial cells and the large mononuclear leucocytes. These cells have two distinct sources of origin, but can easily be distinguished from each other by the "indophenol-synthesis" test for oxydase. The morphology, tinctorial characteristics, and reactions are described in full. In the next place, the author discusses the prognostic value of an examination of an exudate, and arrives at the conclusion that in cases of spreading peritonitis, the amount and virulence of the bacterial invasion, and the extent to which the reactive forces of the peritoneal cavity have been or are being developed can be judged in this manner. The duration of the bacterial invasion is of significance in that it affects the relative number of the various cells, their phagocytic activity, and their physiological condition. From the facts ascertained in the course of his investigations, the author deduces three important dicta. In the first place, while local drainage is often necessary, drainage of the general peritoneal cavity may be unnecessary, and even inadvisable. Secondly, he has come to the conclusion that drainage of the general peritoneal cavity is very rarely called for. His third conclusion is that effective drainage of the general peritoneal cavity is impossible.

(134) Joint Affections in Nerve Diseases.

In anticipation of many cases of central and peripheral nerve injury, associated with joint trouble in soldiers during the present war, J. S. McArdle deals with three types of what he terms *arthritis neurotica* (*Practitioner*, August, 1915). The first is due to peripheral nerve injury, the second to central injury, and the third to affections of the spinal cord not associated with trauma. In the present paper he limits his observations to the first two types. In the first the lesions follow partial rather than complete nerve destruction. The symptoms appear when the scar is forming, and for a long time the arthritis remains local. This condition is usually accompanied by chorea, herpes, or neuritis. When the nerve irritation is removed, the pain disappears rapidly, and the joint functions are restored. McArdle discusses the views put forward in explanation of the joint involvement. In regard to the second type, in which the cord or extremity is mechanically injured, he points out that fever is rarely if ever noted; that the affections of the joints are limited to the paralysed limb, and develop with or after paralysis. The bones below the level of the spinal lesion are tender. As a rule, there is synovial effusion and periarticular exudation. The joint troubles are associated with a doughy œdema, and cutaneous and muscular atrophy. Antirheumatic or anti-gout remedies fail to afford relief, but when the spinal damage clears up, the joints are completely restored to functional activity. The pain and the œdema disappear first; the paralysis clears up next, and, lastly, the thickening and stiffening of the joints. The author is very positive in his assertion that these joint changes are quite different from those of rheumatism, gout, and osteoarthritis.

(135) Traumatic Subdural Hæmorrhage.

Traumatic subdural hæmorrhage is supposed to be rare, but L. Bathe Rawling (*Practitioner*, August, 1915) doubts the truth of this, as he has had a number of patients suffering from this condition under his own care. He gives details of three typical cases. In regard to diagnosis, the injury causing the condition is usually a slight one, and the patient does not show any marked degree of unconsciousness. For a period after the injury he is exceedingly irritable. This symptom indicates laceration or contusion of the surface of the brain. After about 24 hours, the power of speech is lost; this is due to compression over Broca's motor speech area. This localization is explained by the site of hæmorrhage. Among the other symptoms are slight twitchings of the face, and arm. There is usually some raising of temperature. Rawling points out that in extradural hæmorrhage the patient is knocked out completely, and at once. It appears that the hæmorrhage occurs from torn veins, and consequently the blood is under a low pressure. He leans towards the theory that the injured vein in the majority of cases is one of the cortical veins, and not the superior longitudinal sinus. When a cortical vein is torn, the blood extravasates throughout the subdural space. The clot derived from the blood poured out from these veins forms, first of all, over the motor speech area. As soon as the diagnosis is made, the skull should be trephined, and the blood clot cleared out. Recovery will be complete if the operative treatment is conducted early, whereas if it is delayed, definite destruction of the motor area will result. A tourniquet should be applied to reduce the hæmorrhage from the scalp, and the trephine should be applied over the lower motor centres. The author recommends drainage for from 24 to 48 hours.

(136) Operative Treatment of Cancer of the Breast.

In advocating the early operative treatment of malignant disease of the mammary gland, G. E. Armstrong states that the facts should be made widely known that this disease is a local one at first, and that operation at present is the only reasonable method of treatment (*Brit. Journ. of Surgery*, July, 1915). He has previously published the record of the results of treatment of 90 cases of breast tumour, and he now presents a second series consisting of 102 cases. In the first series there were 63 cases of carcinoma, while in the second series there were 87. Five of the latter were not submitted to operation, and he therefore is able to record the results of surgical interference in 63 and 82 cases of carcinoma in the two series. Assuming that those patients who could not be traced had died of recurrence, he calculates that 46 of the patients were alive and well three years or more after the operation. This gives a recovery rate of 30%. Armstrong regards these figures as encouraging, but not satisfactory. The complete operation was performed in each case. This operation he considers to be a safe one. Only one of the 150 patients, on whom he performed it, died. The line of incision was not properly protected, and infection occurred which proved fatal. He is of opinion that the complete operation does not cause any disability, and quotes cases in which the patient was able to perform strenuous manual work after recovery.

GYNÆCOLOGY AND OBSTETRICS

(137) Salpingitis.

Goldstine (*Surg. Gynaec. and Obstet.*, August, 1915) records his observations on the operative treatment of salpingitis. According to his statistics, the largest ætiological factor was the gonococcus. In 197 out of 328 cases the condition was due to this cause; in 43 it was of puerperal origin. It followed criminal abortion in 35 instances. In 86 cases it was due to infection accidentally introduced, or to natural infections. Four of these 86 were definitely due to tuberculosis, and five were secondary to inflammation of the appendix. The pathological range of his series was very wide. Firstly, chronic inflammation of the tubes and ovaries, without pus formation; secondly, cases of hydrosalpinx; thirdly, cases in which the tubes are bulbous at the fimbriated end, and contain a fluid thicker and denser than that of hydrosalpinx. In this class the ovaries are more or less cystic and enlarged, and yield evidence of inflammation. The fourth group consists of cases of pyosalpinx of varying degree, in which there is a moderate amount of destruction of one or both ovaries by abscess formation; the fifth comprise cases of typical tubo-ovarian abscess, with complete destruction of the organs. Adhesions always play a very important part in

the pathology, bringing the organs into many different positions. In chronic salpingitis the adhesions of the tube and ovaries to the uterus, broad ligaments and peritoneum were extremely dense. In the majority of his cases it appeared that the organs had grown together. In pyosalpinx and tubo-ovarian abscess a line of cleavage can usually be found, making the separation quite easy. The intestinal and omental adhesions varied largely in degree, according to the amount of intestine involved and the density of the adhesions. In one case there was a patulous opening between the bowel and the abscess cavity. By far the worst adhesions were found in the puerperal cases. They were usually situated between the ovarian abscess and the intestine. In this infection the ovary was largely destroyed by abscess, due probably to the fact that infection was carried directly to the ovary through the lymphatics, while in ordinary salpingitis the drippings of pus from the fimbriated end of the tube washes over the ovary and causes an inflammatory reaction. Secondary infection with the *bacillus coli communis* adds to the pathology in that it increases the peritonitis greatly and lowers the resistance of the tissue markedly. As regards treatment, he emphasizes the fact that all operations were performed only after the thorough subsidence of the acute stage. He divides the cases into two groups. First, 161 in which the tubes, ovaries and uterus were removed, either by pan-hysterectomy or supra-vaginal hysterectomy. Pan-hysterectomy was performed in 19 cases, in which the cervix was large and soft, and in tuberculosis of the organs. He states that the ultimate results were no better than in the case of the supra-vaginal operation. Of the second group, comprising 162 cases, various operations were carried out. In this group, the chief concern was what to do with the ovaries. An ovary, although it may look healthy at the time of operation, may nevertheless be infected, and later develop cystic degeneration or abscess. His experience is that a considerable number of ovaries, if left, become cystic, and require further operative treatment, and this in a comparatively short time; some as early as six months, and never longer than three years. In those cases which were treated with the object of saving as much as possible of both ovaries, 44 returned with subjective symptoms and objective findings, which warranted a second operation. The main subjective symptoms were continuation of pain, menorrhagia, dysmenorrhœa and persistence of the leucorrhœal discharge. These symptoms, coupled with the finding of a mass on one or both sides, necessitates a second operation. His experience further went to show that a resected ovary or one that had required considerable manipulation to free it from its adhesive attachments, was in the great majority of cases a constant source of pain to the patient, and very prone to become cystic and degenerated. He further asserts that the only sure way to get rid of the persistent leucorrhœa is to perform a supra-vaginal hysterectomy. Respecting the opinions of many authors as to the importance of the ovary, he does not take the stand whereby ovaries should be removed in all cases of salpingitis, but he is of opinion that, as there is no question of a subsequent pregnancy, the question of removal should be carefully considered. The preservation of the menstrual function is aimed at, but this can only be achieved to a full extent in a few cases. The health of the patient is usually impaired, and only rarely does the removal of the ovaries lead to nervous symptoms. In his operative treatment in cases in which the intestinal adhesions were so dense that they could not be separated readily from the mass, the tube and ovary were separated from the uterus and other structures and brought outside the abdomen, thus giving more freedom of action. Adhesions between loops of intestine were not disturbed, unless there was evidence of a possibility of obstruction and raw surfaces were covered by pulling up the infundibular pelvic ligament and the round ligament. The latter were shortened, in order to keep the uterus ante-flexed. This method of covering up the raw surface also had the tendency to prevent prolapsing of the ovaries, when these organs are left. Vaginal drainage was always used whenever the circumstances required it, and in no instance was drainage through the abdominal wound resorted to. The results in tubercular salpingitis were bad. The author rarely removes the tubes now. Cystitis occurred in a few cases, but readily responded to treatment. Thrombophlebitis occurred in the left leg in only two cases. Three cases returned both ventral hernia; in two cases wound infection and suppuration had been present. There were three deaths, not including those in the tubercular cases. Death was due to peritonitis.

(138) Auto-Infection in Gynæcology.

McCann, writing on recent work in gynæcology (*Practitioner*, June, 1915) draws attention to the unfortunate results after operation, even those of a minor nature, and re-opens the question of autogenous and endogenous infection. For this reason, Benthin examined 500 cases bacteriologically. The mortality in those with hæmolytic streptococci was 29.4%. In cases in which they were not present it was 4.2%. An attempt must be made before operation to free the vaginal secretion from bacteria, especially from hæmolytic streptococci. The most effective method seems to be warm douches, with 1 in 1,000 bichloride of mercury. He asserts that this latter warning is especially necessary, owing to the aseptic craze exerting a dominating influence. Disastrous consequences, due to defective preparation and disinfection, have resulted from the performance of trivial operations on the uterus and vagina, because the bacillus coli and not a streptococcus may be the active organism. But although the former may not lead to death of the patient, yet the local effects may be such as to cause long continued or permanent suffering, with important pathological changes in the uterus and adnexæ. Too much stress therefore cannot be laid on thorough disinfection of the vulva, vagina and cervical canal before any operation, however trivial it may be supposed to be, is performed. Vaginal injections should be comfortably warm, not hot, for the latter produce œdema of the vaginal walls and desquamation of the epithelium, thus tending to retard the healing of any cut surface.

(139) Gonorrhœa in Women.

Robinson (*Medical Record*, 1915, LXXXVII.) remarks that a woman may never be aware of the acute stage of gonorrhœa, accustomed, as she is, to having a leucorrhœal discharge of greater or less degree and various premenstrual pains, many of which are severer than those of gonorrhœa. Further, a woman infected by a man suffering from chronic gonorrhœa usually has likewise a sub-acute or chronic gonorrhœa. In treating gonorrhœa in a female, it is just as important to know what not to do as to know what to do. If possible, the infection must be kept from spreading through the internal os to the tubes, the endometrium and the peritoneum. Once the disease has passed the internal os, the treatment is very unsatisfactory. Acute gonorrhœa in women should always be treated by absolute rest in bed. The diet is not important, except that spices, alcohol, etc., must be avoided. If the urethra is involved, balsams, hyoscamus and alkalies should be given. He advises local treatment by douches and suppositories at home and treatments applied by the practitioner. When the discharge is profuse, douches should be used four time a day. The douching fluid should be tincture of iodine, 1 to 4 drams in two quarts of hot water; lactic acid (1: 500 or 1: 1,000) or 4 ounces of alum and one ounce of zinc sulphate or 4 drams of copper sulphate in 1 or 2 quarts of water. If the case be severe he uses a suppository at night of 4 grains of protargol or 10 grains of bacillus bulgaricus tablets. In the surgery, he touches any inflamed or eroded vulvar or vaginal points with 10% to 50% of silver nitrite; he expresses from the Bartholin's glands and ducts any pus they may contain, and injects the ducts with the same solution. For the cervix, tincture of iodine is used, and the canal is treated up to the internal os. Endometritis and salpingitis are best treated by rest, hot or cold applications to the abdomen and tampons saturated in boro-glycerine, ichthyol glycerine or thigenol-glycerine. Strong caustics and curettage are harmful in these conditions. Hot salt baths are good in aiding the absorption of exudates. He does not place much value on vaccine treatment.

British Medical Association News.

SCIENTIFIC.

A meeting of the New South Wales Branch was held at the B.M.A. Building, 30-34 Elizabeth Street, Sydney, on September 24, 1915, Dr. George Armstrong (the President) in the chair.

Before the business of the evening was proceeded with, the President announced that the two members, who had been elected members of the Federal Committee of the British Medical Association in Australia for the year 1916, were Drs. G. H. Abbott and David Thomas.

Mr. H. S. H. Wardlaw, B.Sc., read a paper, communicated jointly by himself and Dr. Henry G. Chapman, on the composition of human milk. The full text of this paper has been published in the *Journal of the Royal Society of New South Wales*. He had carried out a series of over one hundred analyses of samples of human milk from Australian women during the first week of lactation. The analyses had been preceded by a study of the constituents of cow's milk and by a prolonged investigation of methods. He had confined his attention to the determination of the density and the estimation of the amounts of fats, the total solids, the sugar and the protein. Before entering upon a discussion of the results obtained, he pointed out that there were two methods of dealing with variations in the results of analyses. When the variation was small, it was justifiable to take the average as a measure of the normal. In his estimations of the fats of human milk, the majority of the readings varied between 1% and 4.5%. The average of estimations of this kind gave very little real information as to the fat content of any given sample. In the next place, it was possible to plot the results in columns according to the magnitude and to ascertain whether any particular percentage reading occurred more frequently than any other. In the case of the fats, it was seen in the columns that there was almost an equal distribution of the various percentages. Mr. Wardlaw showed, however, that for all other constituents save fat certain values were found, around which the results were more or less closely grouped. These values could therefore be regarded as the most probable values for any given sample of human milk during the first week of lactation. The greatest coincidence was seen in the values of solids other than fats. In 90% of the readings, the values varied between 9% and 9.9%. The total solids expressed in this manner were found to represent 12.8%, the values for milk sugar 7.1% and the protein 1.9%. The estimations of fats ranged over a wider area than those of the other constituents. The minimum estimation was 0.56%, while the maximum was 7.6%. The average percentage of the series was 3.14%. Mr. Wardlaw exhibited curves demonstrating the frequency of each percentage value of each of the constituents. As stated above, the percentage values of solids not fat were grouped within narrow limits; in the case of sugar, the coincidence was not so well marked, but was still obvious; while that of proteins showed little more than a tendency to aggregate around the most common percentage figure. In attempting to explain why the variation in the case of fat was so wide and no one value was represented more frequently than any other, he emphasized the fact that the reason was not to be sought in the adoption of haphazard methods. In all cases, the breasts were emptied as completely as possible, and a careful note had been kept of the period which had elapsed after the previous feeding. That the facts were reliable was shown by the results of the analyses carried out by other observers. The number of observations of the kind on considerable series of cases was small. The figures arrived at by Leeds, by Carter and Richmond and by Camerer and Söldner coincided with his own. He had therefore arrived at the conclusion that the mechanism for producing fat differed in different women, and that this mechanism was dependent on factors other than those controlling the mechanism for the production of the other constituents of milk. During the first 11 days of lactation, the percentage of protein fell from 3.3 to 1.7; the average percentage of fat rose from 2.8 to 4.1 during the same period. In regard to the other constituents, the percentage decreased at first, but subsequently did not vary steadily in any one direction. The only observed effect of the age of the woman on the composition of the milk seemed to be that the protein content of the milk of women between 20 and 30 years was slightly higher than that of the milk of women outside these limits of age. The number of pregnancies did not appear to have any effect on the composition of the milk, and the average fat content of the milk of each breast was found to be practically the same.

On the motion of Dr. Litchfield, Dr. Henry G. Chapman read his paper on "The Legal Standards for Infants' Foods" prior to the discussion on the two communications. The paper is printed in full on page 342 in this issue.

Dr. C. E. Corlette said that he had given a great deal of thought to the subject of Dr. Chapman's very able paper. He agreed with him in the greater number of his deductions. He could not help thinking that the men who were tending advice to the Federal Government in regard to the standards of the infants' foods were not physiologists. He spoke very strongly on the necessity of allowing the scientist to guide the politician in these matters. He regretted to find that no official public health authority was present to listen to Dr. Chapman. Had a public health officer been present, they would perhaps have learned why some of the most popular foods were to be condemned. It has been stated that condensed milk was not a fit food for infants under six months of age. In practice, it had been found that many of the infants' foods on the market gave excellent results. The people who condemned them did not appear to be able to realize that carbohydrates and fats could to some extent supplement each other. The nutritive value was not altered, if the one was diminished and a corresponding number of calories was supplied in the form of the other. It was quite useless to make regulations unless scientific support could be adduced to the arguments. Unfortunately, the Federal authorities would not listen to the voice of science. They acted as if they said: "If science does not agree with us, so much the worse for science."

Dr. W. F. Litchfield thanked Dr. Chapman and Mr. Wardlaw for their important contributions and for the lucid method of presentation. He regarded the question from the clinical point of view. He doubted whether the regulations would produce any marked effect on the public. The most popular food after breast milk was condensed milk. No matter how often the authorities condemned it, this preparation would remain a popular food. Certain babies did badly on any artificial food. The mothers tried one food after another until they found the food which gave the best results. Dr. Litchfield dealt generally with the question of condensed milk and dried milks, without either recommending them or the reverse.

It had been pointed out by Dr. Chapman that breast feeding was almost universally successful. This suggested that the variation in the constituents was not a determining factor whether the baby was to thrive or not. No doubt the composition was important, but there were other equally important factors. He was inclined to the opinion that insufficiency of mother's milk was the most common cause of failure in breast feeding. The only method of ascertaining whether the baby was getting enough of its mother's milk was the use of the scales. In other cases, the infant got too much. An overfed baby suffered from dyspepsia, got fat, and at about six months of age began to fail. Breast-fed infants did not suffer from infective diarrhœa, malnutrition nor nutritive disturbances; artificially-fed infants did. It was therefore not merely a question of the sterility of the food, since Dr. Chapman had shown that some of the infants' foods were practically sterile. Children fed on unimpeachable milk food were often prone to diarrhœa. He was of the opinion that the cause of this was to be sought in a passive immunizing substance, which was present in breast milk but not in artificially prepared milk foods. Newsholme and Peters agreed with this view. On the other hand, the breast-fed children bred in the worst slums were found to do well, while artificially-fed infants under the same conditions did badly.

In the next place, he was convinced that there was some element in milk that prevented the development of scurvy, rickets and marasmus. This something was probably connected in some way with the salts of the milk. He dwelt on the malnutrition which followed on attacks of summer

diarrhœa in artificially fed infants. When this condition occurred in breast-fed babies, there was no tendency toward the development of malnutrition. Until these two constituents of milk had been isolated and added to artificial foods, the latter could not be compared with breast milk.

The speaker was little inclined to follow too far the suggestion that carbohydrates and fats were interchangeable. In conclusion, he spoke strongly against the so-called doctrinaire teaching, which he stigmatized as the worst thing possible.

Dr. E. H. Binney expressed the opinion that the authorities should be guided by the better judgement of men like Dr. Chapman. He agreed with Dr. Chapman that the regulations should admit of wider ranges of the various constituents.

Dr. J. C. Windeyer raised the question whether infants would thrive as well if the quantity taken were less. Dr. Chapman had shown that the greater part of the nutrient was not used up. Did babies, like adults, take in more food than was required for physiological purposes? In support of this suggestion he pointed out that he got better results in some digestive disturbances in infants by the simple expedient of lengthening the intervals between the feeds.

In his reply, Dr. Chapman first spoke of Mr. Halcro Wardlaw's work. He congratulated him very heartily on his achievements. He had spent some years in the laboratory training himself for serious investigations of this kind. The preliminary work of investigating methods for the estimation of phosphates in milk had proved of the greatest value in his subsequent researches. Mr. Wardlaw had learned the relative value of figures. This was extremely important. In turning to the work under consideration, he attributed great importance to the fact that the series of analyses had been confined to a short period of lactation. Later, Mr. Wardlaw intended to continue his investigations in connexion with other periods, but for each period a large number of samples would be dealt with.

He tendered his thanks to Drs. Corlette, Litchfield and Binney for their support. He understood the reason why the authorities had insisted on rigidity of standards was that when greater latitude was permitted, the administration and control became more difficult. Replying to Dr. Litchfield, he pointed out that, as compared with cows' milk, many infants' foods were practically sterile. Infection sometimes occurred when infants were fed on more or less sterile foods. The infection was therefore derived from other sources. There were disadvantages connected with the attempt to replace fats by carbohydrates; the reverse was not feasible. Further, it was impossible to remove all the fat from foods containing milk. All he was asking was that range of fat and sugar permitted should be extended. In answer to Dr. Windeyer he confessed that he did not know whether infants got too much food or not. He was very anxious to learn what the amount of milk taken by a baby in 24 hours really was. This could readily be ascertained by the use of the scales, and information could be relied on if long series of weighings were available.

MEDICO-POLITICAL.

ANNUAL MEETING OF THE DELEGATES OF THE AFFILIATED LOCAL ASSOCIATIONS OF MEMBERS WITH COUNCIL OF THE NEW SOUTH WALES BRANCH.

The annual meeting of the delegates of the affiliated local medical associations with the Council of the New South Wales Branch was held at the B.M.A. Building, 30-34 Elizabeth Street, on October 1, 1915, Dr. George Armstrong (the President) in the chair. Thirteen of the seventeen associations were represented.

Friendly Society Practice.

Dr. R. H. Todd, the Honorary Secretary of the Branch, moved:—

> That, in the opinion of the meeting, the Council of the Branch should be empowered to use its discretion in regard to the exemption of particular Lodges or particular members from the operation of the Common Form of Agreement between Medical Officer and Friendly Society Lodge and in regard to sanctioning modifications of the Agreement to suit particular places and particular circumstances.

In support of this motion, Dr. Todd explained that there existed conditions which rendered it advisable to relax the rigidity of the Common Form of Agreement to a slight extent in particular cases.

The motion was seconded by Dr. G. A. Buchanan (Central Southern Medical Association).

Dr. E. C. C. Page (North-Eastern Medical Association) spoke in opposition to the motion. He and the Association he represented were of opinion that if any modification were recognized, the satisfactory working of the Common Form of Agreement, which had been achieved at some considerable sacrifice, would be disturbed. He thought that it would be unjust to the men who had made these sacrifices to re-open the question so soon.

Dr. L. W. Roberts (Western Medical Association) was in agreement with Dr. Page. Since everything was working well at present, he would oppose any suggestion to effect a change for another twelve months.

Dr. O. E. Withers (Central Southern Medical Association) pleaded for uniformity in regard to the Common Form of Agreement. He had been instructed to oppose the motion. Dr. A. Maitland Gledden spoke in the same strain.

Dr. G. A. Buchanan (Central Southern Medical Association) took the view that in spite of the smooth working and general satisfaction, the Council might well be given discretionary powers. He was sure that these powers would not be used without good cause.

Dr. R. A. Robertson (Border Medical Association) spoke strongly in favour of the motion. In his own Association, it was held that the Common Form of Agreement might become unworkable, unless the Council were permitted to introduce modifications to meet local conditions. Moreover, the Border Medical Association was attempting to assist the profession in Victoria to obtain favourable terms for Lodge practice, and this would be more difficult unless the local conditions could be considered and allowances made. Dr. Sandes agreed with the last speaker.

Dr. Lipscomb urged the meeting to avoid conflicts by providing some elasticity in connexion with the Common Form of Agreement. He suggested the addition of the following words to the motion:—

> provided that no such discretion be exercised without the concurrence of the local Association concerned.

The mover and seconder accepted this suggestion, and the words were therefore added to the end of the motion.

The delegates voted on the question in order to ascertain the feeling of the country members. Five members voted for and two against the motion. The motion was then carried by a large majority when put to the whole meeting.

Dr. G. A. Buchanan obtained leave to withdraw a motion standing in his name to the effect that the advisability or otherwise of altering the Common Form of Agreement be left to the discretion of the Council.

Motion No. 3, moved by Dr. F. P. Sandes (Council), read as follows:—

> That it be a recommendation to the Council that the necessary steps be taken to amend the Common Form of Agreement between Medical Officer and Friendly Society Lodge by the addition to Clause 5, at the end thereof, of the following words, viz.:—
>
> > In the event of a member having ceased to reside in the area of the Lodge, and having become entitled under the provisions of Clause 21 hereof to the Medical Benefit of a Lodge of the same or another Order or Society, which meets in another place, the Medical Officer, on being duly notified in writing to that effect by the Secretary shall forthwith remove such member's name from the list of members to be attended by him, and payment in respect of such member shall be made to the Medical Officer only up to the end of the month in which such notification has been given.

Dr. Lipscomb moved that the words "ceased . . . of the Lodge" be deleted, and that the words "having removed to a distance more than two miles from the Medical Officer's residence" be substituted in their place.

The motion, as amended, was carried.

Motion No. 4 was presented by Dr. R. H. Todd, the Honorary Secretary of the Branch:—

That it be a recommendation to the Council that the necessary steps be taken to amend the Common Form of Agreement between Medical Officer and Friendly Society Lodge by the addition to Clause 19, at the end thereof, of the following words, viz.:—

"nor in any case where such request is made by a member during illness for which he is, at the time, being attended by the Medical Officer."

The motion was lost.

Dr. E. C. Page (North Eastern Medical Association) obtained leave to withdraw a motion to the effect that applicants for admission to Friendly Societies should be required to sign a declaration that their income was less than £208 and that this certificate should be embodied in the certificate from the Lodge Secretary. Dr. Todd pointed out that in the regulations issued by the Branch dealing with contract practice, a rule provided to some extent for this requirement. Regulation 11 read as follows:—

No member shall examine any applicant for admission to the medical benefit of a Friendly Society Lodge who does not bring with him a statement in writing from the Secretary of the Lodge to the effect that he or she is entitled to such medical benefit according to the terms of the Income Limit Clause of the Common Form of Agreement, and who shall not have signed the following Form of Certificate duly completed . . ."

The second clause of the Common Form of Agreement provides *inter alia* for the examination of persons applying for admission to a Lodge on the condition that he or she shall bring with him a statement in writing, signed by the Secretary of the Lodge, notifying that the person would be entitled to the benefits of the Lodge.

War Emergency Organization.

Dr. E. C. C. Page (North Eastern Medical Association) moved:—

"That in the opinion of the meeting each Affiliated Local Association of Members should pass such resolutions as it may deem suitable. and carry out such organization within its area as may to it seem to be best adapted to insure that members who have left their practices for the purpose of undertaking Naval or Military Service during the present war, shall have their practices restored to them upon their return to civil practice.

He proceeded to read the terms of a scheme which had been evolved by the South Sydney Medical Association, and adopted, with slight alterations, by his Association (see *The Medical Journal of Australia*, August 14, 1915, p. 155). He held that the conditions of practice were becoming very difficult in many areas, and that unless some organization were undertaken failure would follow. Dr. W. C. McClelland (South Sydney Medical Association) seconded the motion.

Dr. Todd referred to the discussion which had taken place in the Branch when the scheme was first brought forward. It was held at that time that a uniform scheme for the whole State would not meet the difficulties, which varied in different areas. He approved of the action of the individual local Associations, and promised them support. In view of the serious shortage of medical men for civil as well as for military practice, it was essential that arrangements should be made in the various districts to safeguard the practices of the men away, and to provide the patients with medical attendance. He spoke of the complete readjustment of the areas of practice, which was being effected in the Newcastle district. They would have the effect of preventing two practitioners from covering the same areas in their practices during the time of stress. The motion was passed, as was the following proposed by Dr. G. A. Buchanan (Central Southern Medical Association):—

That where possible medical practitioners in various districts shall make arrangements which will enable one or more of their number to leave the district for the purpose of military service.

In the course of the discussion, the question was raised by Dr. Lipscomb whether any action could be taken to prevent medical practitioners from setting up in practice in districts from which one or more of the men had gone to the front. Dr. Pockley called attention to the fact that medical men had a right to set up in practice somewhere within the State, and bade those present to exercise judgement before they arrived at far-reaching resolutions. It was determined that no rule having general application should be set up, and that each case should be dealt with on its merits after full investigations of the special circumstances obtaining.

Government Medical Officers.

Dr. W. L. Roberts (Western Medical Association) moved:

That the meeting consider the scale of fees payable to Government Medical Officers for services rendered with a view to its revision and the increase of the fees in certain cases.

He explained that up to a short time ago the mileage paid to medical witnesses at Coroner's inquests had been quite inadequate. In April of this year a modification had been introduced, and this matter was now satisfactorily solved. On the other hand, the fees paid for the certification of lunatics and for inspection of dead bodies were quite inadequate. Under the Government regulations it was laid down that the fee for examination, together with the issue of a certificate and the giving of evidence in Court, should be one guinea. He held that a special fee should be paid for the examination, and the same should apply in regard to the inspection of dead bodies and similar matters. Incidentally he mentioned that the Area Medical Officers who examined cadets might have to travel a distance of 70 miles for this purpose. They were paid the sum of £60 *per annum*. He suggested that the authorities be approached and requested to grant a reasonable fee in keeping with the nature of the work required. Dr. O. E. B. Withers (Central Western Medical Association) seconded the motion.

In discussing the matter, Dr. Litchfield (Council) thought that the responsibility of examining the body of a dead person and advising the authorities as to the necessity of further investigations justified a fee of one guinea. The Council was therefore recommended to endeavour to have the regulations amended to include a fee of one guinea for the examination and report, and a special fee of one guinea for giving evidence, as well as one guinea for inspecting dead bodies. Dr. Todd called the attention of members to the inadvisability of supplying coroners with reports without arriving at an understanding in regard to a fee, since if no inquest were held, the coroner had no power to pay a fee.

Annual Subscription.

Dr. R. A. Robertson (Border Medical Association) moved:

That in the opinion of the meeting the annual subscription for members, outside the metropolitan area, of 60 years or over who have been members of the British Medical Association for 30 years be £3 3s. per annum, instead of £4 4s.

The original motion on the business paper was modified to this form. The object of the motion was to relieve country members who had been in practice for many years, and who were no longer deriving any direct benefit from the medico-political activity of the Branch. The view was expressed that members obtained a great deal in return for their money. They received *The British Medical Journal* and *The Medical Journal of Australia*, and all the advantages of the organizing work of the Branch. Drs. Pockley and Lipscomb held the opinion that the subscription of four guineas was too low. Trade unionists paid more to the organization of their unions, and the fact that the Federal Government and the State Governments were now recognizing the Association as a body of importance rendered it quite essential that larger funds should be accumulated to carry on the important public work of the Association. Dr. Pockley thought that ten guineas would be a reasonable subscription. Other members pleaded for consideration for country members, who did not obtain the advantages held by metropolitan members of being able to attend meetings. In the end, a vote was taken, and an equal number of *ayes* and *noes* were recorded. The Chairman threw in his casting vote in favour of the *status quo*.

Uniform Rules for Local Associations of Members.

Dr. W. F. Litchfield (Council) moved:—

That it be a recommendation from this meeting to the several local Associations of Members throughout the

State that they ought to adopt without modification the draft rules for Affiliated Local Associations of Members approved by the Organization and Science Committee, 29th June, 1915.

He explained that Dr. Todd and Mr. Barr Brown had spent a great deal of time and energy in drafting a set of uniform rules, which would embody the chief provisions contained in the existing rules of the various associations. Latitude of action was provided for by the clause dealing with regulations for each association. These regulations would become effective after the consent of the Council had been obtained. Dr. Todd explained the position, and stated that while the draft rules were placed in the hands of the members, they were asked to accept a uniform constitution for the local associations, and to leave the less fundamental matters to the Regulations, which could be more easily altered from time to time. The motion was carried.

The Training of Nurses.

Dr. E. C. G. Page (North Eastern Medical Association) moved:—

That in the opinion of this meeting private hospitals in country towns ought to be placed on the same footing as public hospitals in regard to registration as training schools for nurses; and that negotiations with the Australasian Trained Nurses' Association be entered into with the object of bringing this about.

He pointed out that the institution of private hospitals in country districts had been rendered necessary by the action of the Government. It had been the policy of the Labour party to open the doors of the public hospitals to the whole community. In self-defence, practitioners had been forced to use private hospitals for all serious cases of illness. One difficulty had been felt. This was in connexion with the provision of nurses. It was almost impossible to obtain the services of nurses unless training could be given. The same men attended the two kinds of hospitals, and it was quite easy to arrange for the same lectures to be given in the private as in the public hospitals in the country. He asked for the same facilities to be given to the one as to the other.

Dr. Pockley (Council) seconded the motion. He held that Dr. Page had made out a very good case. In the further discussion the recognition of the private metropolitan hospitals by the A.T.N.A. was referred to, and the opinion expressed that similar privileges should be extended to country hospitals. Dr. Binney thought that the A.T.N.A. was justified in requiring a guarantee that the training should be adequate. Dr. Todd pointed out that the provisions of the "Private Hospitals Act, 1908," offered a sufficient safeguard, and he was hopeful that this view might be taken by the A.T.N.A. Practical unanimity on the main points existed, and the motion was carried without dissention.

Out-patient Departments in Country Hospitals.

Dr. G. A. Buchanan (Central Southern Medical Association) moved:—

That in country hospitals Out-patient Departments should not be recognized except for the immediate treatment of accident and other urgent cases.

He pointed out that there was no necessity for the existence of out-patients departments in country hospitals at all. They merely tempted persons who could pay to obtain treatment without payment. The abuse was considerable in his district. Various members supported the proposal, and a diversion was made by a reference to insurance societies which offered as an attraction policies carrying with them the right to hospital treatment. The members expressed complete disapproval of this practice, and the suggestion was made that the Council might consider the matter with a view of some action being taken. The motion was carried.

Bush Nurses.

The last motion on the paper stood in the name of Dr. G. A. Buchanan (Central Southern Medical Association) to the following effect:—

That the authorities in charge of the Bush Nurses be requested to provide for the information of medical practitioners definite rules and regulations covering the duties of Bush Nurses in the several districts.

An interesting discussion ensued. Instances, more or less concrete, of bush nurses overstepping the limits of the duties of nurses were adduced, and cases were spoken of in which nurses imported from England were quite unfit to hold the position. It was suggested that in some of these cases the nurse had not been appointed by the Bush Nursing Association. A few members spoke in favour of stronger measures being taken than those proposed by Dr. Buchanan, but it was generally recognized that the first step in every case of the kind must be to ascertain what regulations existed, and if it were found that these rules were not being respected, further action might be instituted with reasonable prospect of success. Members agreed that it would be advisable if special cases properly authenticated of nurses exceeding their duties could be collected. The motion was carried.

The meeting terminated with a hearty vote of thanks to the President.

A special meeting of the Western Australian Branch was held at the Perth Public Hospital on September 20, 1915, Dr. Merryweather (the Vice-President) in the chair.

The chairman said the meeting had been called to consider the Health Bill now before the State Parliament. He invited the Hon. Dr. Saw, M.L.C., to express his views.

Dr. Saw stated that the Bill made it compulsory for sufferers from venereal disease to put themselves under the treatment of a medical practitioner. It hoped to prevent the spread of disease by isolating and attending those likely to spread it (male and female). He objected to the right to lock up any sufferer, however innocently infected and whatever care they might be willing to take. He suggested that only those wilfully spreading the disease should be isolated. He proposed the following amendments:—

Clause 242 (1) Insert words requiring any accusation that a person suffering from venereal disease should be written and on oath, and to allow the accused to see the accusation and have a written copy and the right to know the name of the accuser.

242 (2) Re power of detention. Insert that the disease must be in an infectious stage and liable to affect other persons.

242 (3) Add "and likely to spread the disease."

242 (4) Safeguard those who would not spread the disease intentionally.

Add "the Commissioner shall conduct bacteriological examinations free if required by a medical practitioner."

242 (2) Permit to sell authorized remedies only to be given to pharmaceutical chemists, except when there is none within ten miles.

Dr. Merryweather then read a letter from Dr. Matthews, of Kalgoorlie, and one from Dr. Myles, of Moora.

Dr. Seed proposed the following amendments:—

Clause 242 (*a*) (1) Delete imprisonment from penal clauses for treating diseases in an unauthorized manner.

242 (*a*) (2) Substitute "at the same time" for "immediately after."

242 (*d*) and (*e*) £5 penalty suggested in each case instead of £20 and £50 (fines to doctors for not notifying).

242 (*f*) £2 penalty suggested instead of £5 (for failing to give patient written precautions).

242 (*i*) (1) The examination when ordered by the Commissioner to be in the presence of the patient's own medical adviser, if so desired.

242 (*k*) (2) Re treatment free of charge. Omit all words after "Default" and add "such medical practitioner shall receive adequate remuneration from the State for the work done."

Penalty £5 suggested.

Dr. Clement moved and Dr. Moss seconded:—

That the President and the Secretary consult a solicitor on the question of legal liability of medical practitioner notifying under the Act; and also in the proper wording the above amendments to 242 (*k*) (2). Carried.

Dr. Seed proposed and Dr. Lillies seconded:—

That a fee of 5s. be paid for each notification.

As an amendment, Dr. Couch proposed and Dr. Paton seconded:—

That a fee of 2s. 6d. be paid for each notification.

The amendment was carried, and the original motion therefore lapsed.

Dr. Couch moved and Dr. Woods seconded:—

That a fee of £1 1s. be paid to the medical practitioner for his examination and report.

As an amendment, Dr. Saw moved and Dr. Gill seconded:

That the wording be left to the solicitor, and that no specified sum be mentioned.

The amendment was carried, and was passed as a substantive motion.

Dr. Saw considered that any person detained should have the right to apply periodically in writing to a Judge of the Supreme Court or a Police Magistrate or a Resident Magistrate in the district for re-examination, with a view to release if no longer infectious.

Dr. Saw asked if the meeting was in favour of his amendments.

It was moved by Dr. Seed and seconded by Dr. Clement and resolved:—

That Dr. Saw's amendments be approved.

Dr. Paton moved and Dr. Seed seconded the following motion:—

That this meeting of the Western Australian Branch of the British Medical Association, while disagreeing with certain details of the amendment to the Health Act as present before the Houses of Parliament, agrees to its main principles, feeling that legislation is urgently required for the repression or prevention of venereal disease.

The motion was carried.

The Western Australian Branch has determined some time ago to accord gratuitous treatment to returned wounded and sick soldiers, provided that the Government will supply the drugs and dressings. Arrangements have been made with the Pharmaceutical Chemists' Association, and a scale of charges has been drawn up. Dr. F. C. Hadley has acted as the intermediator between the Branch and the Chemists. Bills will be presented for payment to the representatives of the Defence Department.

A meeting of the Council of the Western Australian Branch was held in the third week of September. It was decided that the Vice-President, Dr. Merryweather, should act as Representative of the Branch on the Federal Medical War Committee, and that he should be appointed Chairman of the State Medical War Committee, and be associated with Drs. Saw and Lotz.

The following have been elected members of the New South Wales Branch:—

Dr. A. E. Machin, Royal North Shore Hospital.
Dr. H. V. D. Baret, Waterfall, Sanatorium.
Dr. S. R. Stafford, Women's Hospital, Surry Hills.

BELGIAN DOCTORS' RELIEF FUND.

Western Australia.

We have been asked to publish the list of subscriptions to the Western Australian Branch of the Belgian Doctors' Relief Fund which was started on June 21, 1915. The last subscription was received on July 31, 1915.

	£	s.	d.
Dr. Ambrose, T., Subiaco	2	2	0
„ Barker, G. W., Perth	1	1	0
„ Birmingham, W. P., Fremantle	5	5	0
„ Boyd, T. C., Northampton	1	1	6
„ Butler, F. S., Beverley	1	1	0
„ Chapman, H. O., Jardanup	1	1	0
„ Clement, D. P., Perth	3	3	0
„ Couch, J. K., Perth	1	1	0
„ Dean, E. C., Bridgetown	1	1	0
„ Dermer, W. T., Fremantle	2	2	0
„ Frost, A. J., Northam	1	1	6
„ Hadley, F. A., Perth	5	5	0
„ Harada, Y., Broome	2	2	0
Drs. Holland and Deakin, Perth	1	1	0
Dr. Hope, J. W., Perth	1	0	0
Carried forward	29	8	0
„ Hume, J., Mount Magnet	2	2	0
„ Kerr, C. Douglas, Wellington Mills	1	0	0
„ Landon, G. F. S. Perth	2	2	0
„ Lewis, J. B., Narrogin	1	1	0
„ Lillies, G. L., Perth	1	1	0
„ Martin, A. E., Perth	2	2	0
„ Mead, G. E., Perth	3	3	0
„ Merryweather, R. C., Perth	5	5	0
„ Nelson, W. H.	3	3	6
„ O'Brien, J. F., Sandstone	1	1	6
„ Officer, E. A., Perth	5	5	0
„ O'Meara, P. M., Southern Cross	2	2	0
„ Paton, D. D., Perth	1	1	0
„ Prendergast, J. J., Malcolm	1	1	6
„ Ramsay, J. E., Perth	3	3	0
„ Rigby, W. H., Collie	2	2	0
„ Seed, W. P., Perth	2	2	0
„ Sweet, W. S., Perth	5	5	0
Sympathiser	0	10	6
Dr. Thom, A. P., Meekatharra	2	2	0
„ Thurston, E. P., Coolgardie	1	1	0
„ Triado, A. J. J., Marble Bar	0	10	0
„ Watch, N. B., Leederville	1	1	0
„ Wilson, T., New Norcia	0	10	0
„ Woods, C. W. T., Perth	3	3	0
„ Yule, J. S., Broome	1	1	0
Total	£83	9	0

THE LIVERPOOL CAMP ENQUIRY.

Analysis of Evidence.

The report issued by his Honour Mr. Justice Rich, Royal Commissioner, appointed to enquire into the charges contained in a speech delivered in the Federal Parliament by Mr. Orchard, contains a number of statements and certain recommendations. These statements and recommendations have been based partly on the evidence given before the Royal Commissioner and partly on his Honour's own observations. The record of the evidence is an extremely bulky document, and no useful purpose would be served by its publication in these pages, even if space rendered this possible. It is proposed to analyse the statements and recommendations contained in the report *seriatim*, more especially in regard to the charges made concerning Captain Schlink.

General Insufficiency of Equipment.

(1) and (4) Clothing, uniforms, overcoats, bedding, etc.—His Honour records his opinion that there was serious insufficiency of supplies of these commodities in the month of June, and that an attempt was made to obtain adequate supplies from headquarters, but for the time being without success. The evidence given by the witnesses certainly supports these conclusions, but in several cases it would seem as if the witnesses were discontents, who had been stimulated to make the case out as black as possible.

His Honour states that the evidence of recruits in regard to having to wait for a supply of underclothing, etc., was uncontradicted. The evidence given by recruits undoubtedly remained uncontradicted in so far as the specific instances were concerned; it could scarcely be otherwise. But the evidence of Colonel Stanley goes to show that some doubt exists as to whether the state of affairs was as it had been described. In reply to a question whether the witness would be surprised to know that there were numbers of men in the camp who had been in camp for weeks and weeks and had not received underclothing, Colonel Stanley replied that he would be distinctly surprised. Several other replies were given in a manner which suggested that the story told by the recruit witnesses should not be accepted without some modification. The evidence was therefore not contradicted, but it was also not confirmed.

His Honour recommends that the Quarter-Master should provide great coats, clothing, underclothing, blankets and mattresses, etc., in anticipation of the arrival of the recruits, and with this recommendation everyone will agree. It is quite obvious that some mismanagement has occurred in the past in regard to the supplies of these commodities, and

that some of the men were a considerable time without the essential bedding and clothing.

(2) Rifles for training purposes, obsolete rifles, defective rifles, and (3) want of rifle practice.—The chapters dealing with these matters are short. In view of the fact that this subject is not a medical one, and that the complaints are directed wholly against the military authority, we refrain from entering into a discussion of the evidence or of the findings of the Royal Commissioner.

The Unsatisfactory State of the Medical Service.

(1) Hospital arrangements, including sick parades.—His Honour very wisely distinguishes the establishment of the hospital from its administration. In regard to the former he points out that the accommodation at the Liverpool Army Medical Camp is for 150 patients, and that extra accommodation is provided in the two cottages and in the measles hospital, in the measles contact camp, and in the venereal compound. He is inclined to the opinion that the accommodation is sufficient for the needs of the camp. Moreover, he finds that no difficulty should be felt in extending the accommodation to meet requirements. The evidence of Captain Schlink, however, shows that considerable difficulty was experienced in obtaining a sufficient number of tents when the hospital was shifted to its present position. There is very little doubt that the hospital is small, when the number of sick men is taken into consideration, but still more important is the fact that each hut and tent is undoubtedly overcrowded. These facts were brought out in the evidence, and have been confirmed subsequently by several competent judges. His Honour neglects to recognize the part which Captain Schlink played in improving the general arrangements of the hospital, and in providing the men with comparatively satisfactory accommodation in spite of marked difficulties.

The equipment of the hospital is the subject of some severe remarks by his Honour. These remarks are fully justified by the evidence, but we venture to examine in some detail the causes of the shortcomings, and to seek for an explanation of some of the events which have given rise to criticism. It was admitted that the supply of bedpans and urinals was inadequate; but it would seem that repeated applications were made to headquarters for these articles. In the end, the Red Cross organization came to the rescue, and provided a certain number of them, so that the supply was equal to the demand. His Honour made a great deal out of the allegations that jam pots or tins were used on occasions for the purpose of urination. An orderly in one of the wards of the hospital gave an account of this use of jam tins. Shortly before his Honour had pointed out that he had not had any evidence on this point. It appears from this man's account that when he was told off for duty in the ward he had two bed pans, a slipper and a couple of urinals. Shortly after, one of the urinals was borrowed for a ward in the new hospital. There were from 12 to 16 patients in the ward. In order to facilitate the work, the orderlies got hold of some jam tins, and gave them to the patients to urinate in. The tins were then emptied into a larger tin, and a little disinfectant poured into them. This witness also stated that he had found one urine pan insufficient for night use. He thought that there should have been two. It is not clear whether any real difficulty is supposed to have arisen from these improvised utensils. On the other hand, Captain Schlink stated that he had never heard of any patient using a jam tin for the purpose of micturating, and if such a thing were known the patient would have been "crimed." This witness contended that there was a sufficient supply of bed pans, urinals and other utensils during the whole time of his command. The evidence corroborating the alternative use of jam tins is a little doubtful. It would therefore seem that even if this practice had obtained, it was a convenience for which the orderlies were responsible, and which in itself was comparatively harmless. It must be admitted that in a properly equipped hospital these utensils should be present in sufficient number to prevent the necessity of the employment of make-shifts.

His Honour makes a bold statement that these utensils were used indiscriminately by persons suffering from infective complaints. As far as we are able to trace the evidence on this point, the state of affairs was actually somewhat different. In a ward containing men suffering from infective diseases the use of jam tins may have occurred. But in any case it is doubtful whether any risk was run, firstly because disinfectant was used, and secondly because, with reasonable care, no spread of infection is likely to follow a practice of this kind. Nevertheless, this practice should not be allowed, and as Captain Schlink stated, if it were known by those in authority, someone would have been punished.

The next incident is the medicine bottle incident. His Honour appears to have been led away by the statement of men who had no conception of the objects of a hospital. Under ordinary conditions in civil practice, an out-patient department is regarded as a necessity. Out-patients are given medicine in bottles to take home with them. In a military hospital the practice of giving the men medicine to dose themselves with in the tents is not encouraged, for obvious reasons. In regard to the men in hospital, the necessary medicines are supplied. In regard to those men who are suffering from minor ailments, draughts are ordered, and the men have the opportunity of drinking the draught in the dispensary. On the other hand, a certain number of men applied for bottles of medicine from the dispensary, and the dispensers, probably under instructions, were required to ask the men to bring bottles with them for the purpose. It must be assumed that this form of dosing cannot be avoided altogether in a camp; but it should be discouraged. It would, in our opinion, be much better for the men if they were placed more completely under the care and control of the medical officers, and if no medicines were taken away unless a prescription signed by the doctor were handed in. The whole point is a small one, and his Honour was scarcely justified in giving it prominence.

(To be continued.)

Obituary.

ARTHUR VERGE.

It was our painful duty to record last week the death of Dr. Arthur Verge, of Sydney, at the age of 34 years. As is well known, Dr. Verge was serving with the 6th Regiment of the 2nd Light Horse Brigade in Turkey, when illness overtook him and led to an untimely termination of a most promising career.

Dr. Verge was educated at King's School, Parramatta. He matriculated at the Sydney University in the year 1899, and by dint of hard work, minute application to his tasks and considerable aptitude, he singled himself out from the men of his year as a distinguished student of medicine. He always took a high place at the various examinations, and lost no opportunity to maintain it. He graduated in 1903.

After passing his final examination, he obtained the position of Junior Resident Medical Officer at the Sydney Hospital, and at the expiration of his term of office, he became Senior Resident Medical Officer. Early in 1906 he went to Europe to continue his medical education. First of all, he went to Edinburgh, where he obtained the diploma of Fellow of the Royal College of Surgeons of that city. He studied dermatology under Norman Walker, and thus laid a foundation for his future career as a specialist. Proceeding to London, he worked under Pringle, and later he crossed over to the Continent, attending courses in Paris under Brocq and in Vienna and Berlin.

Equipped in this manner, he returned to Sydney in 1910, and commenced practice as a dermatologist. In 1911 he was appointed Junior Honorary Physician for diseases of the skin at the Royal Prince Alfred Hospital. His experience gained in Europe, his keen insight into the pathology of skin affections, his wide grasp of his speciality and his untiring interest in the work all contributed to make him a most valuable officer. He utilized every opportunity offered him, and made full use of the facilities of his department. He had made a special study of syphilis, and this proved of great importance, both to his patients and to the progress of his work.

During his student life, he had shown a keen interest in athletics. While at school, he had represented St. Paul's

College in rowing, cricket and football. Later he won his "blue" in cricket and football, and represented the Sydney University for several years in these sports. He played cricket for New South Wales, and was a member of the New South Wales and Australian football teams, playing full-back.

In the summer of last year, when the whole world was horrified at the outbreak of the great European war, Dr. Verge recognized his duty without hesitation, and determined to throw up his practice in order to join the colours. He obtained a commission as captain, and became attached to the Second Light Horse, 6th Regiment. In this capacity, as in that of a skin specialist, he exhibited every good quality and rendered his work of the greatest utility by the exercise of skill, exertion and painstaking care.

Few men made greater sacrifices than he did in throwing up a young but promising special practice in Sydney to bear his part of the Empire's burden. This sacrifice entailed the loss of a capable medical officer after a few months' service; and at the same time it may be said that it has caused an inestimable loss to the whole profession. His was a valuable young life, full of promise of a future replete of usefulness to the community, cut short by the brutalities of war at a time when his vigour, knowledge and capabilities were at their highest point. The void will be felt more especially by those who worked with him and who knew him best.

Personal.

The death of Dr. John O'Brien, Senior Assistant Resident Medical Officer at the Goodna Asylum, Queensland, was announced on September 20, 1915. On the 14th, Dr. O'Brien met with an accident while motoring. The injury received did not at first prevent him from carrying out his duties, but on the following day it became apparent that a serious trauma had affected his skull. He was ordered to a private hospital, where he died on the 20th inst.

The announcement of the death of Dr. L. A. Wright, from epidemic cerebro-spinal meningitis, was published in the daily press on October 1, 1915. Dr. Wright appears to have contracted the disease early in September or late in August. He was admitted to the Melbourne Hospital, and succumbed on the last day of September. It is stated that the military authorities accorded Dr. Wright a military funeral.

We note with regret that the name of Dr. E. L. Hutchinson, of Wee Waa, was omitted from the list of medical officers serving in the A.A.M.C. The list was printed without alteration or amendment from the list supplied to us by the Defence Department. Dr. F. C. Hittmann has, we understand, acquired Dr. Hutchinson's practice in Wee Waa.

Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, locum tenentes sought, etc., see "Advertiser," page ix.

Charters Towers District Hospital, Medical Superintendent.

Cue-Day Dawn Hospital, Medical Officer.

Diary for the Month.

Oct. 12.—Tas. Branch, B.M.A., Monthly and Council.
Oct. 13.—Melb. Pædiatric Society.
Oct. 14.—West. Med. Assoc. (Wellington), N.S.W.
Oct. 14.—Vic. Branch, B.M.A., Council.
Oct. 15.—East. Sub. Med. Assoc.
Oct. 19.—N.S.W. Branch, B.M.A., Executive and Finance Committee; Ethics Committee.
Oct. 20.—Vic. Branch, B.M.A., Clinical.
Oct. 20.—W. Aust. Branch, B.M.A., General.
Oct. 20.—Western Med. Assoc. (N.S.W.), Wellington.
Oct. 22.—Q. Branch, B.M.A., Council.
Oct. 26.—N.S.W. Branch, B.M.A., Organization and Science Committee; Medical Politics Committee.
Oct. 26.—Vic. Branch, B.M.A., Eye and Ear Section.
Oct. 27.—Vic. Branch, B.M.A., Council.
Oct. 28.—S. Aust Branch, B.M.A., Monthly.
Oct. 29.—N.S.W. Branch, B.M.A., Ordinary.
Oct. 29.—Melb. Hosp. Clin. Soc.
Oct. 30.—Vic. Branch, B.M.A., Nomination Papers for Election to Offices issued (returnable Nov. 10).
Nov. 4.—North-East. Med. Assoc. (N.S.W.), Grafton.
Nov. 5.—Queensland Branch, B.M.A., Monthly.
Nov. 8.—South Australian Branch, Council.
Nov. 9.—Tasmania Branch, B.M.A., Monthly and Council.

Important Notice.

Medical practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, 429 Strand, London, W.C.

Branch.	APPOINTMENTS.
QUEENSLAND. (Hon. Sec. B.M.A. Building, Adelaide Street, Brisbane).	Brisbane United F.S. Institute.
WESTERN AUSTRALIA. (Hon. Sec. 230 St. George's Terrace, Perth).	Swan District Medical Officer. All Contract Practice Appointments in W.A
NEW SOUTH WALES. (Hon. Sec. 30-34 Elizabeth Street, Sydney).	Australian Natives Association. Balmain United F.S. Dispensary. Burwood District F.S. Institute. Canterbury United F.S. Dispensary. Goulburn F.S. Association. Leichhardt and Petersham Dispensary. M.U. Oddfellows Med. Inst., Elizabeth Street, Sydney. Marrickville United Friendly Societies' Dispensary. Mullumbimby District Friendly Societies. N.S.W. Ambulance Association and Transport Brigade. N. Sydney United F.S. People's Prudential Benefit Society. Phœnix Mutual Provident Society. F.S. Lodges at Braidwood. F.S. Lodges at Casino. F.S. Lodges at Lithgow. F.S. Lodges at Mudgee. F.S. Lodges at Orange. F.S. Lodges at Parramatta, Penrith, and Auburn. F.S. Lodges at Wellington. Newcastle Collieries— Killingworth. Seaham Nos. 1 and 2. West Wallsend.
SOUTH AUSTRALIA. (Hon. Sec. 3 North Terrace, Adelaide).	The F.S. Medical Assoc. Incorp., Adelaide.

EDITORIAL NOTICES.

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